THE BOOK of KNOWLEDGE

The BOOK *of* KNOWLEDGE

The Children's Encyclopedia

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DEPARTMENTS

The Earth
Stories and Legends
All Countries
Golden Deeds
Helps to Learning
Literature
Animal Life
Famous Books
Dominion of Canada
The United States
Familiar Things
Our Own Life
The Fine Arts
Men and Women
Poetry and Rhymes
Plant Life
Things to Make
and Things to Do
Book of Wonder

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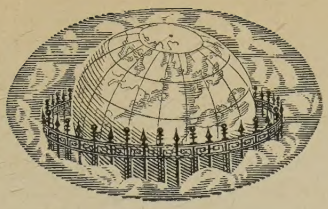

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This is a short guide to the principal contents of this volume. It is not possible to give all of the questions in The Book of Wonder, or the titles of all of the Little Verses and Problems, but in all cases the pages are given where such sections of the book begin. In the big Index, Volume 20, you will find every title and every subject, including the pictures.

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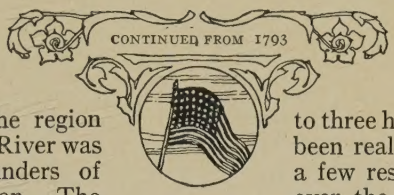
THE HISTORY OF THE UNITED STATES

IN this section we return to the story of our country. After the Constitution was adopted, new states began to ask for admission to the Union. In this volume we trace the growth of our country in territory, population and wealth. You will find that the West of which we speak has always been the country which lies beyond, and has meant different things at different times in our history. We tell how we secured Florida and the Oregon country, and how, after a short war, we gained from Mexico a great extent of land in the Southwest, including California, and thus extended our territory to the Pacific. We tell also of the rise of the Mormon power and of the discovery of gold in California, which drew people there like a fire-alarm, and of the dangers and difficulties which met those traveling across the plains in wagons or on foot, before the days of railroads. The conquest of the West is a stirring story—more thrilling than any drama.

THE GROWING WEST



THE West has meant quite different things at different times in our country's history. The region along the Connecticut River was the West to the founders of Plymouth and of Boston. The country around Pittsburgh was once the far West. Then Tennessee, Kentucky, Mississippi and Ohio became the West as population advanced. Next the country across the Mississippi was called the West, and not until later were the Rocky Mountains crossed.

All this means that the West has been the unsettled part of the country, where wild beasts and Indians were to be fought by the settlers as they moved on. Now farms and villages are seen in almost every part of the country, and great cities have grown up, and are growing up, in every part of the Union. Soon the West will mean something entirely different. The buffalo has disappeared, the wolf, the bear and the mountain lion are going, and in a few years there will be no more large tracts of land without inhabitants.

WHY THE EARLY SETTLERS MOVED WEST

In the early colonial days the land near the seashore was first taken. As more people came over, they sometimes went farther into the land, and sometimes bought the farms of the first settlers, who themselves moved. At the time of the Revolution only a narrow strip along the Atlantic, one hundred to three hundred miles wide, had been really settled, but already a few restless men had crossed over the Alleghany Mountains into the Mississippi Valley. If you will turn back to the map in the first volume you can see what that meant. From the northern part of New York state down to Georgia, the mountains stood like a wall to keep back the travelers.

But in spite of these mountains, the restless colonists made their way into the fertile river valleys beyond, and then moved on across the prairies. The Constitution gave Congress power to make new states whenever the population of a district or territory was thought to be large enough, and we shall see that new states have been made, until there are now many more than the original thirteen. Let us see how and when some of these new states were admitted into the Union.

THE FIRST NEW STATE ADDED TO THE UNION

The first new state was not admitted in quite the same way as those that were made a little later. When Champlain, of whom you read on page 679, came down from Canada to the lake which now bears his name, he looked at the beautiful mountains to the east and said, "Voilà les verts monts!" "Behold the green moun-

tains!" So you see that Champlain named both the lake and the state, and the name of the state translated into English is Green Mountains.

This territory was claimed both by New Hampshire and New York, and both colonies sold the land to settlers, but New Hampshire sold more. When the king of England finally decided that New York had the better claim, the settlers, in 1777, declared that they would not submit to New York, but would make an independent state, to be called either New Connecticut or Vermont. This was during the Revolution, and New York could not enforce its claim. During the Revolution Ethan Allen, Seth Warner and others were active against the British. It was Ethan Allen, at the head of a band calling themselves "Green Mountain Boys," who captured Fort Ticonderoga, May 10, 1775, and gained military supplies much needed by the colonists.

After the Revolution the Vermonters tried to get Congress to acknowledge them as independent. Congress did not wish to offend New York, and it was not until after the Constitution had been adopted that the new government listened to them. In 1790 New York agreed to give up all her claims on payment of $30,000, and on March 4, 1791, Vermont took her place as the fourteenth state.

THE SCOTCH-IRISH AND GERMANS COME TO PENNSYLVANIA

Now let us turn to another part of the country. As we told you in Volume Two, not all the settlers in the colonies were English, though most of them came from the British Isles. Many came from the North of Ireland and were sometimes called Scotch-Irish because the ancestors of many of them had gone from Scotland to Ireland. Many Germans also came. These people generally landed in Philadelphia, and went to western Pennsylvania. So many came because of the wise laws made by Penn that the later comers found the best lands taken. Many of them moved southward into Virginia and the Carolinas.

Daniel Boone was born in Pennsylvania, but while still a boy, his family moved southward to the banks of the Yadkin River, in North Carolina. Boone grew up to be a mighty hunter, married, and built a cabin on the bank of the river. Recently some patriotic people have rebuilt the cabin and furnished it exactly as it was in Boone's time, so that the children of to-day can see how their ancestors lived. But Boone did not like farming. He liked much better to go on long hunting trips, sometimes lasting for days, or even weeks, during which he could kill deer, bears, panthers, squirrels and wild turkeys.

DANIEL BOONE AND OTHERS EXPLORE KENTUCKY

Boone heard from a white man named John Finley of a wonderful region over the western mountains which was a hunter's paradise. In 1769 Boone, with five others, crossed over into the country, which was sometimes called by the Indians the "dark and bloody ground," because different tribes of Indians had fought many battles there. It seems that few Indians lived there all the time, but many came to hunt. For six months the hunters wandered through the valleys and over the hills, sleeping under the stars or in caves. The other men returned to North Carolina, but Boone was joined by his brother, and the two remained all winter in a little log cabin they had built. In the spring his brother returned to the settlements to get more ammunition and supplies and to guide any other hunters who might wish to come.

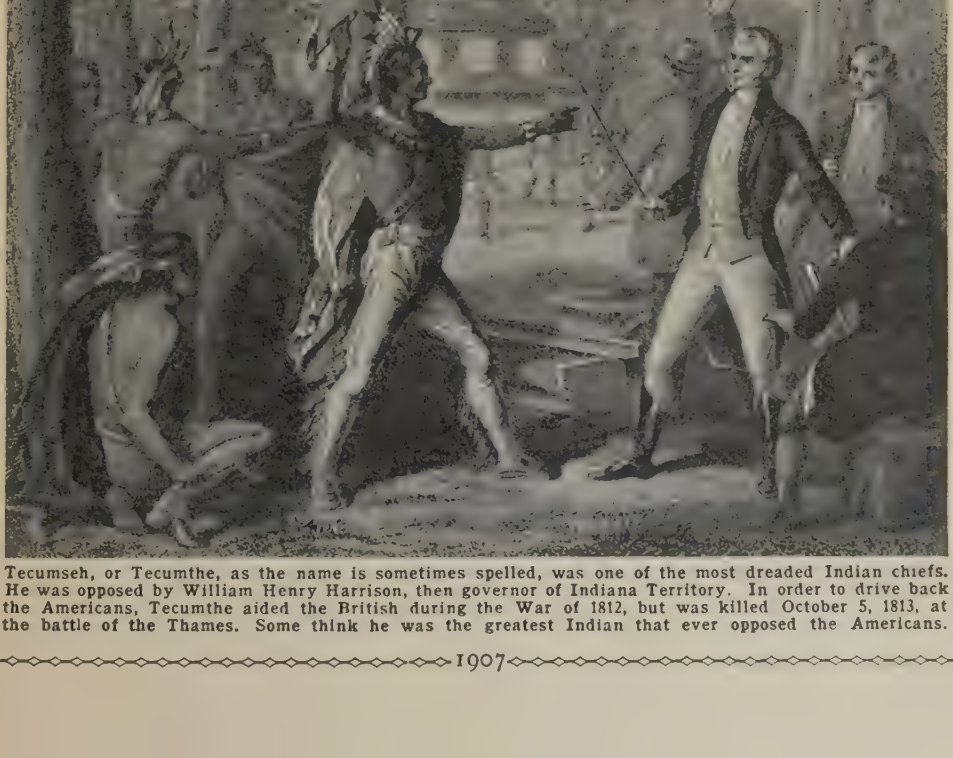
For three months Boone remained alone, two hundred miles from a white man, without a horse or a dog. Other hunters came, but in 1771 all returned to their homes in the East. But the story of what had been found beyond the mountains had spread all over Virginia and North Carolina, and many men wished to try their fortunes in the new land. Many things hindered them, but in 1774 and 1775 settlements were founded which were so strong that the Indians could not break them up, and after the Revolution settlers came rapidly. The territory was considered a part of Virginia until 1790, and on June 1, 1792, became the state of Kentucky, the fifteenth star on the flag.

SETTLERS CROSS THE MOUNTAINS INTO TENNESSEE

James Robertson was one of the men who went with Daniel Boone to Kentucky on one of his trips, but he liked the country on the banks of the Watauga River in what is now Tennessee better than that farther west. He therefore led a party of North Carolina settlers there in 1770, but a few white men had

ETHAN ALLEN AND GENERAL HARRISON

You read in the text of the "Green Mountain Boys." Perhaps their most famous achievement was the capture of Fort Ticonderoga from the British, May 10, 1775, before the Revolution had really begun. Led by Ethan Allen, they surprised the post, arousing the commander from bed, and took it without the loss of a man. The military supplies captured were much needed, and were useful at Boston.



Tecumseh, or Tecumthe, as the name is sometimes spelled, was one of the most dreaded Indian chiefs. He was opposed by William Henry Harrison, then governor of Indiana Territory. In order to drive back the Americans, Tecumthe aided the British during the War of 1812, but was killed October 5, 1813, at the battle of the Thames. Some think he was the greatest Indian that ever opposed the Americans.

already built cabins in the region. They had to meet the same kind of hardships as the Kentucky settlers mentioned above, but brave men joined them. They made a sort of agreement known as the Watauga Association, but soon they were organized as Washington District and then as Washington County, North Carolina, as that state claimed the land to the Mississippi River. These settlers were brave and daring. A weak man had no place among them. When they heard that Major Ferguson was in North Carolina on the way to lay waste their territory, they hurried over the mountains to meet him. Joining other bands from Virginia and North and South Carolina, they surrounded him at King's Mountain, as you may read in the story of the Revolution, and captured his force. Then they returned to their homes.

THE WESTERNERS ATTEMPT TO SET UP A STATE

As Congress had no money to pay its debts at the close of the Revolution, it asked all the states holding western lands to give them to the general government. North Carolina agreed in 1784, but the settlers in the West did not like being transferred without their consent, and set up a new state for themselves, which was called the State of Franklin. As money was scarce, they fixed the salaries of their officers at so many beaver and raccoon skins, and taxes could be paid in skins or produce.

When North Carolina heard of this, the act making the gift of the territory to Congress was at once repealed and the state began to try to regain control of the rebellious people. For a while the people held out, but they were not encouraged by Congress, and soon the State of Franklin was no longer in existence. Again, in 1790, North Carolina surrendered the territory to the new government under the Constitution, and June 1, 1796, Tennessee was admitted to the Union as the sixteenth state.

The great body of land north of the Ohio River, from which the states of Ohio, Indiana, Illinois, Michigan and Wisconsin have been made, was claimed by Virginia under her charter. Parts were also claimed by Massachusetts and Connecticut. All these states claimed the land under their charters which had been given before anything was really known about America. New York also claimed some of it. All of these states finally gave to Congress their claims in this Northwest Territory, as it was called. Congress decided to sell these lands at a very low price in order to get money to pay the debts of the Confederation.

THE NORTHWEST TERRITORY ALSO GAINS SETTLERS

A company in which there were many Revolutionary soldiers was formed to buy lands in this territory and settle a colony. In 1787 Congress passed an act selling five million acres of land and also making laws for the government of the territory. It was provided that not less than three nor more than five states should be made as the population increased, and that when any territory had 60,000 people it should be admitted into the Union. Slavery was never to be allowed.

At once people began to move into the territory. Many of them made their way to the Ohio River, built great flatboats, a picture of which we show you, and floated down. Early in 1788 Marietta, named in honor of Queen Marie Antoinette of France, was begun. This was the first settlement in what is now the state of Ohio. A few months later, Cincinnati (first called Losantiville) was begun.

The companies advertised for settlers, saying that they had the richest and most beautiful country in the world. The land was the richest, the climate the best, and life was easiest in the Ohio country. Settlers came by the thousand, and the older states were alarmed. It seemed as if all their strongest young men were moving westward. So pamphlets were written in opposition, saying that the soil was not good, that the climate was cold, that the woods were full of Indians, panthers and terrible snakes, and that any man was a fool who would leave a comfortable home in the East and risk such dangers as he would meet in the West.

Part of both stories was true. Some of the land was good and some was bad. There were Indians and they troubled the settlers, and destroyed some small settlements. For a while the rush toward this part of the West was checked, but a few years later it began again, and in 1803 (February 19) Ohio was admitted as a state. Other states were soon to be made from the Northwest Territory.

LIFE IN THE WOODS AND ON THE RIVER

Here is a band of hunters and trappers in the wilderness with their rude hut in the background. Around the camp-fire they told the story of what had happened during the day. Perhaps the man on the log is telling how he killed the deer. They kept their rifles near for fear of Indians or wild beasts. Many men loved the life in the woods so much that they could not live comfortably after settlers came.

When the West meant the country across the Alleghanies, a common way of going was to build or buy a flatboat, load upon it all the household goods and live stock, and then float down the Ohio River. This type of boat was called a "broadhorn" because of the two steering oars you see in the picture.

DISPUTES WITH SPAIN IN THE SOUTH CAUSE TROUBLE

Now we have told of the territory in the North and in the middle of the country. What of that in the South? You remember that Great Britain kept Florida, which it had taken from Spain at the end of the French and Indian War. Twenty years later, in 1783, it was returned to Spain. The country then called Florida was divided into two parts. East Florida was almost the same as the present state, while West Florida stretched along the Gulf of Mexico to Louisiana, which was also owned by Spain. Georgia claimed all the territory westward to the Mississippi, but Congress said that it had been a part of West Florida and had been given up by Great Britain, and that Georgia had no rights at all. Settlers moved into the country in spite of the attempts of the Indians to prevent them, and in 1798 Congress set up the territory of Mississippi.

HARDSHIPS OF LIFE IN THE WESTERN COUNTRY

But after the settlers built their homes in these western forests, they found that all was not easy. It is true that game was plentiful and that corn and wheat grew rapidly, so that it was easy to get food enough. Flax grew well, and rough linen was manufactured by the women, and, since skins were plentiful, all could have clothes. They could not, however, make everything they needed, and they could get these things, which they could not produce themselves, only by trading their skins and furs or what they had grown on their farms. They could not very easily climb the mountains and take these things back to the old states. What could they do?

The easiest thing was to put them on a flatboat and float down the Mississippi with them. But Spain owned the land on both sides of the mouth of the Mississippi, and Spain was unfriendly to the United States. So every boatload that went to New Orleans was either captured or was forced to pay high duties. The United States was not strong enough to force Spain to allow the boats to pass freely and to trade with New Orleans or Mexico, and the western people grew angry. Some wished to fight and capture New Orleans. Others said that the western people ought to declare themselves independent of the United States and make a treaty with Spain. A few even wished their country to become a province of Spain.

THE EASTERN STATES TRY TO PREVENT THEIR PEOPLE MOVING WEST

All this trouble with Spain about the Mississippi was ended when that nation gave up Louisiana to France. You read on another page how we purchased it in 1803, and you were told how much the New England states opposed buying it. Soon a part of the territory asked to be made a state. There was great excitement in the East when this was first talked about, and much opposition. The eastern states had seen a large part of their population go to the cheap lands in the West. Some men said that unless Congress stopped making new states, the whole East would be deserted and ruined.

They also said that the Constitution did not give Congress power to make new states from any land which was not a part of the country when the Constitution was adopted. This was a new question and was very important, as less than half of the territory of the United States to-day was a part of the country in 1789. Some New England men threatened to secede. But in spite of their threats Louisiana became the eighteenth state in 1812, just before the second war with Great Britain began. Now there were seventeen states east of the Mississippi and one west of the great river.

We have already told of the War of 1812, and shall not say more about it now. After the war there was another great movement toward the West and Indiana was admitted into the Union in 1816; Mississippi came next in 1817, and these were shortly followed by Illinois in 1818, and Alabama in 1819. Many immigrants to the United States soon began to come, and it was not long before England was much troubled to find so many of her citizens coming to the United States.

WE GET RID OF SPAIN BY BUYING THE FLORIDAS

The same year that Alabama came into the Union, Spain sold all her rights in Florida for $5,000,000. Another trouble was ended. Spain had not governed the country well, and bands of robbers, white, black and red, had done much damage to the people of Georgia and Alabama. The United States now was beginning to stretch across the continent. It con-

CROSSING THE SIERRA NEVADA

Though the Western mountains were high and rough, occasionally a low place, called a gap or pass, was found over which a crossing could be made, though often with great difficulty. Here we see wagons crossing the Sierra Nevada Mountains, or rather going around the edge of them. Notice the straining oxen, and the men pushing with all their might to gain the top. Beyond we see a wagon train descending.

trolled all the land east of the Mississippi and south of Canada, and nearly as much beyond. There were now twenty-two states, and only four more have been made from the territory east of the great river. We shall learn of them soon.

You remember that James Madison was president while the War of 1812 was going on, and for several years afterward. When his two terms were over, another Virginian, James Monroe, became president, in 1817, and he also served two terms. A number of important things happened during these years. The most important for us to mention in our story of the West is what was called the Missouri Compromise. In order to understand it we must go back a little.

Before the Revolution all the colonies held slaves, both negro and Indian. It was soon found that the Indians were not reliable or industrious and so they were no longer held in slavery. It was also found that the negro slaves were not profitable in the North. The climate and the soil did not suit them very well, and so, about the time of the Revolution, the people there began to set them free, or else to sell them to the South.

FOR A TIME SLAVERY SEEMED TO BE DYING OUT

Some of the southern states did not find slavery profitable, and at the time the Constitution was adopted most people believed that the number of slaves would grow smaller and smaller, except in South Carolina and Georgia, where it was thought to be too hot for a white man to work in the rice-fields. It was thought that perhaps a few would be kept for house servants and that the others would gradually be set free.

A LITTLE INVENTION CHANGES THE HISTORY OF THE WORLD

All this was changed by an invention which has changed the whole history of the United States and of the world. At that time the summer clothing of the common people was chiefly coarse linen, while the wealthier wore finer linen or silk. Cotton cloth was very expensive. A small patch of cotton was grown upon almost every southern farm, but the great difficulty was to separate the fibre from the seeds. It was then done by hand, and we are told that it was the task of the slaves, and sometimes of the children of a family, to separate a shoeful of the cotton between supper and bedtime. A whole day's work was only about four pounds. The process was so slow that little cotton was used at home and still less could be sold.

After the Revolution Georgia presented a large tract of land to General Nathanael Greene on which he lived until his death in 1786. In 1792 Mrs. Greene was returning to her plantation, after a visit to relatives in New England, when she met on the boat a young man named Eli Whitney, who had just graduated at Yale College and was on his way south to teach. When he reached Savannah, he found that the position which he had expected was no longer open, and he accepted Mrs. Greene's invitation to spend some time on her plantation while looking for another opportunity.

One day a number of gentlemen dined with Mrs. Greene and discussed the need of a better way of separating the cotton. Young Whitney had shown skill in mending clocks and such things, and Mrs. Greene told the gentlemen that she believed Mr. Whitney could make a machine. Though he knew nothing about cotton, he at once set to work, and early in 1793 produced a cotton gin which could do the work of a hundred slaves. Hundreds of others were built, and cotton soon became cheaper than linen, and the demand increased very rapidly. Another man, Hogden Holmes, about the same time also invented a machine.

SLAVERY AT ONCE BEGINS TO GROW AGAIN

More and more land was planted in cotton, and more and more laborers were needed. Slavery had been dying out because there was not enough work that slaves could do, which paid the owners. The great increase in the cotton-fields made it profitable to own slaves wherever cotton could be grown, and many more were brought from Africa. The southern states up to this time had grown many different kinds of crops, and some of them had many small factories of different kinds. Afterward they grew more cotton than any other crop, and many of the little factories died out. In New England, where cotton could not be grown, factories to make goods to sell in the South increased in number and size.

After slavery had died out in the North, many people grew to believe that it was wrong to keep slaves, and wished to prevent any new states from having

SCENES IN WESTERN LIFE

Before the days of railroads in the West, judges and lawyers traveled from courthouse to courthouse on horseback, as the roads were too rough and too narrow for carriages, and there were few bridges across the streams. When Abraham Lincoln was a struggling young lawyer in Illinois he traveled in the same manner as the party you see in the picture, and amused his companions by his stories.

When the Mormons were driven out of Illinois, and Joseph Smith, the founder of the sect, was killed, Brigham Young, the new leader, went in search of a new home. Far beyond the inhabited region he came upon the Great Salt Lake and there determined to found a new state where his people would not be disturbed. This was the beginning of what is now Utah, where there are still many Mormons.

them. The question came up in 1818, when Missouri asked to enter the Union as a slave state. Many people objected, and the House of Representatives in 1819 refused to agree to admit the new state, though the Senate was in favor of admission. Maine was now also asking admission as a free state. The House agreed, but the Senate refused to consent unless Missouri was admitted as a slave state. Finally it was agreed that both should be admitted, but that in the future slavery should not be allowed in any part of the Louisiana Purchase north of 36° 30′, which was the southern boundary of Missouri. This is called the Missouri Compromise.

WHAT DID THE MISSOURI COMPROMISE MEAN?

A compromise is an agreement by which both parties agree to take less than they ask for, for the sake of peace. This compromise was not a good bargain for the slaveholding states. Missouri was added to the Union as a slave state, but the only part of the Louisiana Purchase south of the line, from which other slave states could be made, was what is now Arkansas and Oklahoma, while north of the line was the immense territory from which nine have been entirely or partly made. But the compromise brought peace for a while. Maine was admitted finally, March 15, 1820, but it was not until August 10, 1821, that Missouri became a state.

AN ELECTION WITH ONLY ONE CANDIDATE FOR PRESIDENT

Though the dispute occurred during Monroe's administration, it did not make any enemies for him. At the end of his first term no candidate opposed him. He received the vote of every elector except one, who voted for John Quincy Adams, saying that no man except Washington should receive a unanimous election. The Federalist party was dead, and only the Republican or the Democratic-Republican, as it was beginning to be called, was left, though all men did not have the same ideas.

Another important event of Monroe's administration was the announcement of what is known as the Monroe Doctrine. The Spanish colonies in South and Central America had rebelled and gained their independence, but Spain was hoping to get them back by force. In 1823 President Monroe sent a message to Congress saying that the United States would object if any European power should attempt to take any part of North or South America. We would not interfere with the possessions they had then, but they must not try to get any more.

During Monroe's time a great public improvement which had great influence was built. This was the Erie Canal, which reached from the Hudson River at Albany to Lake Erie. It was begun in 1817 and finished in 1825. The man who had more to do with it than any other was De Witt Clinton, whose picture you will find on page 1694. The canal boats were pulled by horses, and traveled very slowly, we should think—hardly more than three miles an hour. But a team of horses could pull a heavy load, many times as much as they could pull up the mountains.

THE ERIE CANAL CAUSES A GREAT INCREASE IN WEALTH

The effect was wonderful. Before this time it cost about $120 a ton, or six cents a pound, to carry goods from New York to Lake Erie. Soon the rate fell by way of the canal to less than a cent a pound. The canal boats carried passengers also. Before the canal was built, New York City was growing very slowly. We are told that between 1810 and 1816 the population increased only thirty-six hundred. Between 1820 and 1830 the population increased nearly sixty thousand, and continued to increase. The New York merchants grew wealthy selling goods to the West, and the people in that region were delighted to be able to get goods out of or into their country so cheaply. The rush toward the West began again, and soon Michigan Territory, from which the states of Michigan and Wisconsin were made later, gained many settlers.

MASSACHUSETTS AND VIRGINIA FURNISH THE PRESIDENTS

The next president after Monroe was John Quincy Adams, whose father had been president before him. He had great faith in the growth of the United States, and wanted to gain more territory than we then had. He was in favor of taking Canada, buying Texas, annexing Cuba and of extending the United States to the Pacific. He believed that some day all this territory would be needed, but he was a man who made more enemies than friends and could not get Congress to act

THE MEDICINE DANCE OF THE WINNEBAGO INDIANS

You read something of the "medicine men" on page 164 of our book, and there learned of the powers they were supposed to exercise over the evil spirits which brought sickness and other forms of bad luck. Here we see the "medicine dance" of the Winnebago Indians, who are a branch of the great Dakota family, which is more commonly called the Sioux. The original picture was drawn by an officer of the United States army who had spent much time among them. The Winnebagoes have always opposed us. They fought for the French during the French and Indian War, and for the English during the Revolution and the War of 1812.

as he wished. One reason was that the people of the new states said that they were tired of having the president chosen from Massachusetts and Virginia. At the end of Adams' term, the Constitution had been in operation forty years. During that time Virginians had been president thirty-two years and Massachusetts men eight.

Therefore, at the election in 1828 Adams was badly defeated by Andrew Jackson, the hero of New Orleans. Though Jackson was born in North Carolina, he had removed when a young man to Tennessee, then considered a part of the West, and became very popular with the people across the mountains. The common people thought of him as one of themselves. The other presidents had been men of education and the Westerners called them aristocrats. Jackson had been born poor and had little education. He had endured the hardships of life on the frontier, and had been a famous Indian-fighter, and knew what the people of the West wanted. His election meant that what Europe thought or said would have less influence than it had had before.

JACKSON, THE WESTERN MAN, BECOMES PRESIDENT

So many interesting things happened during the eight years Jackson was president that we can tell only a few. The trouble about the United States Bank is very hard for young people to understand, and we can only say that Jackson had his way and destroyed it. South Carolina felt that many of the laws made by Congress to help the manufacturers of New England were unconstitutional and unjust, and declared that she would refuse to obey, or "nullify" them. But though Jackson had been born in the South, he said that the Union must be preserved, and that if necessary he would send troops to make South Carolina obey.

This attempt of South Carolina to nullify the laws of Congress showed that the South was getting restless, and some wise men began to fear the trouble which later brought about the Civil War. The South felt that it must have new territory, but it was not sure where it could get it. No new states had been admitted for fifteen years at the time Arkansas came in as a slave state (June 15, 1836), balanced by Michigan (January 26, 1837). What is now Oklahoma had been taken for the Indians, who were made to move from Georgia and Florida. Except Florida there was no more territory in which slavery was permitted.

HOW TEXAS GAINED HER INDEPENDENCE

The country along the Gulf of Mexico beyond the United States possessions was called Texas by the Spanish and Mexicans. Americans began to move into this region about 1819, and very soon large numbers had arrived. Both Adams and Jackson tried to buy the territory, but Mexico, which had gained her independence from Spain, refused to sell. The Texans began to talk about independence, and in 1835 fighting began. The Texans soon showed that they were better fighters than the Mexicans, organized the Republic of Texas and asked to be admitted to the United States. Many northern men opposed taking Texas, because they feared that it would give so much more slave territory. We shall hear more of Texas a little later.

During Jackson's term of office the first railroads were built in the United States, anthracite coal was used in an engine, a reaping machine was invented, and many other important inventions began to come into use.

After Jackson came Martin Van Buren. His administration was unfortunate, as times were very hard, especially in the West, where nearly every man was buying or selling land. The people then believed that every little village would some day be a great city, and everybody speculated in land. Some of these villages have since grown into cities, but all could not grow at once.

A NEW PARTY ELECTS A PRESIDENT WHO SOON DIES

Van Buren was given only one term, and was followed by William Henry Harrison, a soldier of the War of 1812 and a famous Indian-fighter. The party which had elected him had grown up during Jackson's time, and its members were called Whigs. President Harrison died only a month after he became president, and the vice-president, John Tyler, of Virginia, succeeded him, but he spent most of the time that he was president quarreling with Congress.

All this time daring explorers and settlers were going farther and farther west. The American Fur Company had opened a road to the Oregon country. Captain Bonneville in 1832 discovered the Great

A BUFFALO HUNT IN THE WEST SIXTY YEARS AGO

The early settlers found a few buffaloes, or bisons, as they are properly called, east of the Alleghany Mountains, but across the Mississippi millions were found. They roamed the plains in great herds, sometimes numbering several thousand. The Indians captured them by driving them over cliffs or into deep snow, or by attacking them on horseback, as shown in the picture, which was made from a painting. The white man with his gun was a more dangerous enemy and thousands were slaughtered for their hides or for their tongues, and left for the wolves. Now there are only a few left, most of them in parks or zoölogical gardens.

Salt Lake, and missionaries to the Indians settled in Oregon a little later.

John C. Fremont, a young army officer, made three trips to explore the Rocky Mountain country in 1842, 1843 and 1845. He had good guides and traveled over a large part of the country, but hardly deserved the name of "Pathfinder of the Rockies," which his friends gave him.

President Tyler greatly favored annexing, that is, joining, Texas to the United States, and in spite of the opposition of those who opposed slavery, succeeded just before the end of his term. Texas became a state, with the right to be divided into five states later if it desired. But the Texans have been so proud of the size of their state that they have never wished it to be divided.

PRESIDENT POLK WISHES TO EXTEND OUR TERRITORY

The next president, James K. Polk, of Tennessee, not only wished to add Texas but California besides. He was determined also to settle the Oregon question in some way. Just what Oregon was, nobody knew exactly. The name was given to the country along the Pacific coast north of California which belonged to Mexico. The coast had been explored by Spaniards, Englishmen, Americans and Russians, but for many years there were no permanent settlements.

In 1819 Spain had agreed that she would not claim any territory north of what is now California. Five years later Russia agreed that she would claim nothing south of 54° 40′. This left a large stretch of territory along the Pacific Ocean claimed both by Great Britain and the United States. As it was considered worthless except for furs, it had been agreed several years before that both nations might settle or hunt in the country until an agreement should be made.

"FIFTY-FOUR FORTY OR FIGHT" AND THE OREGON COUNTRY

Missionaries and scattered settlers made their way into the region, and sent word that there was excellent land and that the United States ought to have the country. Soon there were several small settlements. The British had no settlements except the forts to protect the fur-traders. Great Britain was quite willing to make the Columbia River the boundary line, but this would have given her nearly all of what is now the state of Washington. The Americans demanded all of the country up to the Russian line of 54° 40′, and a popular saying in 1844 was, "Fifty-four Forty or Fight," meaning that if Great Britain would not give up all the Oregon country up to 54° 40′, we would fight for it. But this would have cut Canada off from the Pacific Ocean and Great Britain would not agree. During Polk's administration, by a compromise, the boundary line was fixed where it now stands. Great Britain took what is now British Columbia, and another large addition was made to our territory.

WAR WITH MEXICO OVER TEXAS FINALLY BEGINS

Mexico had never acknowledged the independence of Texas and had threatened the United States. When Polk sent a man to try to buy California, the Mexicans would not listen to him. Besides, Mexico said that some of the land claimed by Texas as a part of that country had never been so called and that she would never give it up. So President Polk ordered General Zachary Taylor to advance into the disputed territory and close the Rio Grande (Great River). Soon a body of Mexicans (April 24, 1846) attacked a small part of his force. The President declared that Mexico had begun war against the United States, and on May 13, 1846, Congress declared war against Mexico.

SOME NORTHERN MEN OPPOSE THE WAR WITH MEXICO

Not everyone was in favor of the war with Mexico. New-Englanders generally opposed the war, saying that they did not wish to help the South gain more territory for slavery. Therefore very few men in the army that was raised came from the northern states, but the South was enthusiastic and many volunteers offered themselves for the war. The two chief commanders, Scott and Taylor, were also southern men, and so it was called a southern war. New England has generally opposed adding new territory to the Union. You remember how the Louisiana Purchase caused the New England men to threaten to secede. As soon as war was declared, General Taylor was ready to advance.

GENERAL TAYLOR'S INVINCIBLE ARMY ADVANCES

Now a series of battles began in which the American arms were always success-

During the whole of the Mexican War our troops seemed always successful. Monterey was well fortified and was defended by a force larger than General Taylor's, but was soon taken. General Taylor's horse "Whitey" was as well known to the army as his owner, and both seemed to enjoy being under fire. At Resaca de la Palma and later at Buena Vista the result was the same as in the earlier battles.

General Winfield Scott at the head of 12,000 men landed at Vera Cruz, on the Gulf of Mexico, in March, 1847, soon captured the city, and started on the toilsome march into the interior. Finally, after several battles in which his troops behaved like veterans instead of untrained militia, the capital was taken, September 14, and the army entered the city of Mexico, which Cortes had taken three hundred years before.

ful. At Palo Alto General Taylor defeated a larger force of Mexicans on May 8, 1846; again defeated the same troops at Resaca de la Palma the next day; and then crossed the Rio Grande in pursuit of the flying Mexicans. On September 24, Monterey was captured, though defended by a larger force than the attacking party. A large part of General Taylor's army was then sent to join General Scott, the commander of the army in Mexico, who was ordered to land at Vera Cruz on the coast and capture Mexico City.

The Mexican general, Santa Anna, knew of the departure of these soldiers, and hoped to defeat Taylor's little army before marching to meet General Scott. Therefore, with 20,000 men, he attacked the little American army of 5,000 men at Buena Vista on February 23, 1847, but was badly defeated. It seemed that Taylor's army could not be beaten.

While General Taylor was marching into Mexico, General Kearny, who had been sent into New Mexico, captured Santa Fé without firing a gun, and then turned to aid in the capture of California, but found that Fremont had already aided the Americans living in the territory to take possession of the country.

General Scott is as successful as General Taylor

Meanwhile General Scott landed at Vera Cruz in March, took the city and defeated Santa Anna at Cerro Gordo in April. When the march on Mexico City began in earnest, another series of brilliant victories began. Contreras was taken on August 20, Churubusco the same day, and in September, the castle of Chapultepec, which was a part of the defenses of Mexico City, was taken by storm though bravely defended. On September 14 the victorious army entered the city which Cortes had taken more than three hundred years before. The American forces had been wonderfully successful.

Mexico was now helpless and was forced to make peace. All claim to Texas was given up, and in return for the sum of $15,000,000 California and what was called New Mexico were also unwillingly surrendered. From this territory have been made the states of California, Nevada and Utah, and parts of Colorado, New Mexico and Arizona. Five years later another strip of land, south of the two last-named, was purchased for $10,000,000, and the territory of the United States proper became the same that it is to-day.

The new religion Joseph Smith preached

But would this wide country ever be filled? It is not all thickly settled yet, but while the Mexican War was going on, a settlement was made in Utah which is very interesting. In 1830 Joseph Smith, a farmer living in New York state, published a book which he said was the translation of a book written in strange letters on golden plates. He declared that an angel had shown him where these plates were buried in the earth. The book said that the American Indians were descended from the lost tribes of the Jews, and told of the mighty deeds of Mormon, who was a pious Christian and a great warrior.

A Mormon church was set up in Fayette, New York, but soon moved to Ohio, and then to Missouri. The Mormons were driven out of Missouri, and in 1840 founded the city of Nauvoo in Illinois, which soon had 12,000 inhabitants. Joseph Smith had entire control in all things, and soon the people of the country began to say that the Mormons were a danger to the state. It was feared that the city would be attacked by a mob, and Joseph Smith and his brother were both killed in 1844.

The Mormons attempt to move out of the United States

The Mormons still held to their belief, in spite of persecution, and determined to move westward, where there were no people to trouble them. In 1847 a party reached the Great Salt Lake, which was then in Mexican territory. Here they set up a government and brought all the other members out. Many converts were made in the East and in Europe, and their settlement grew rapidly. They brought water from the hills to irrigate their fields and raised large crops, which they sold at good prices to travelers on the way to California.

Soon the leaders began to preach polygamy, that is, that it was right for a man to have more than one wife. It was believed that the Mormons were intending to build up an independent state which should not be subject to the laws of the United States but only to the officers of the church, and in 1857 a small army was sent out to keep order, but no

WASHING GOLD AND FIGHTING INDIANS

Much of the gold in California in the early days came from the beds of streams. Prospectors roamed the country examining every brook. The man is shaking the box, in which a shovelful of sand has been placed. The gold is heavier than the sand and sinks to the bottom, while the sand and soil are washed away. This is called placer mining, and any man could do it, as no expensive tools or machinery were required. At the present time most of the world's output of gold is obtained from deep mines.

While bands of travelers or settlers were crossing the plains in wagons, they were sometimes attacked by Indians, who attempted to drive off their cattle if they could not capture the wagons. When we think of the dangers and the hardships of pioneer days in the West, we wonder that any were brave enough to risk crossing the plains. Perhaps your grandfather can remember such an event as this.

fighting occurred. Many Mormon missionaries were sent to eastern states and to Europe, and thousands of converts moved to Utah. Many walked all the way from the Missouri River to Salt Lake City, as the few wagons were needed to carry the baggage and provisions, and much of the country through which they passed had few or no inhabitants. This was a journey of three months, and hundreds perished on the way.

In spite of the presence of the army the Mormons kept up their practices. During the Civil War they were left very much alone, and not until they wished the territory of Utah to be made a state did they declare that they would give up polygamy. Many other charges were made against the Mormons, but they were never entirely proved.

Gold is discovered in California

While this community was growing up, other settlements of a different sort were growing up farther west. Early in 1848, just before the treaty of peace with Mexico was signed, gold was found in California. The news spread rapidly, and the little towns in the West were deserted while the inhabitants dug for gold. When the news reached the East, thousands of farmers left their plows, mechanics dropped their tools, clerks and professional men left their desks, to seek their fortunes in the gold-fields. Some made the long journey in sailing vessels around Cape Horn, others crossed the Isthmus of Panama, and then made their way north, others took the long, dangerous trip across the plains, suffering much from hunger, thirst and the attacks of Indians.

The population of California was small when it came under American rule. Though it had been visited by Sir Francis Drake, and had been explored by Spaniards from Mexico, about 1600, few settlers had gone until after the establishment of the missions to the Indians. Father Junipero Serra, with some Franciscan friars, began in 1769, and before 1823 twenty-one missions and two chapels had been established. Several important California cities and towns have grown up on the sites of the old missions. Among them are San Francisco, Santa Barbara and San Diego. Many Indians were converted and taught some of the arts of civilization. Following the friars, a few Spaniards or Mexicans established great cattle ranches. The property of the missions had been confiscated by the government after Mexico revolted from Spain, but few settlers had come.

During 1849 nearly 100,000 people poured into California, drawn by the stories that many miners were finding gold worth several thousand dollars every month. Towns sprang up in a night in districts where gold was found. Many of the new-comers were honest men, but many gamblers and ruffians also came, and robberies and murders were frequent. As the country grew so rapidly, there were not enough officers to keep order, and so the better men organized what they called Vigilance Committees, which tried men accused of crimes and punished them if found guilty. When satisfactory courts and laws were established the Vigilance Committees no longer met.

Soon the population of California was large enough to become a state, but again the dispute arose as to whether it should be slave or free. The Missouri Compromise line crossed it, and both North and South claimed it. The people of the state, however, wished it admitted as a free state, and this was done by the Compromise of 1850.

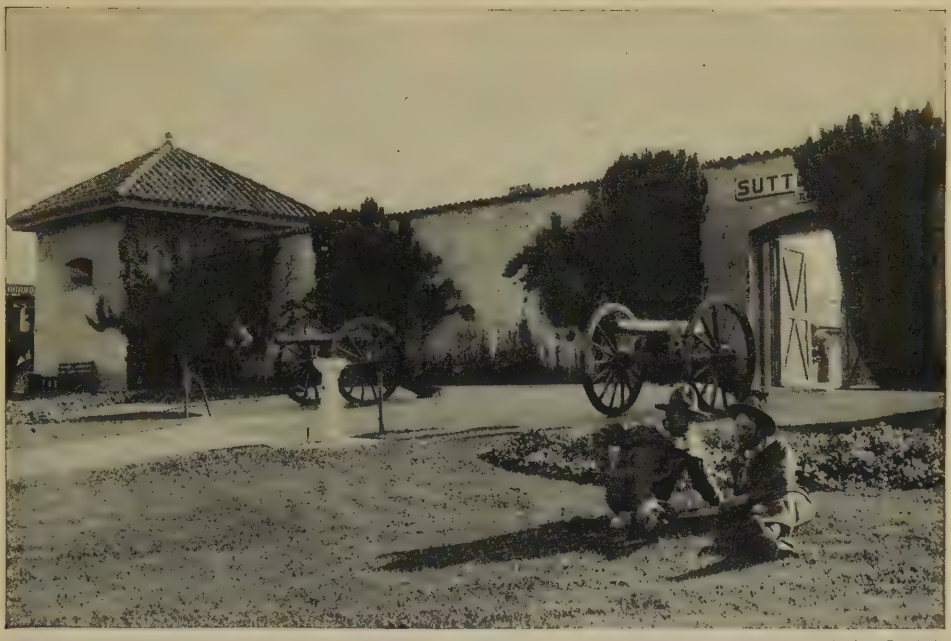
A similar rush to the gold-fields a half century later

All of you have heard of the Klondike, and know of a rush very much like this one to California when gold was discovered in Alaska. Very much the same sorts of things happened in Alaska which happened in California about fifty years before. When you come to read of Alaska on page 5789, you can understand California better. A visitor to that state now finds it very hard to believe what he reads about the days of "forty-nine," that is, the year 1849, during which there was the greatest excitement.

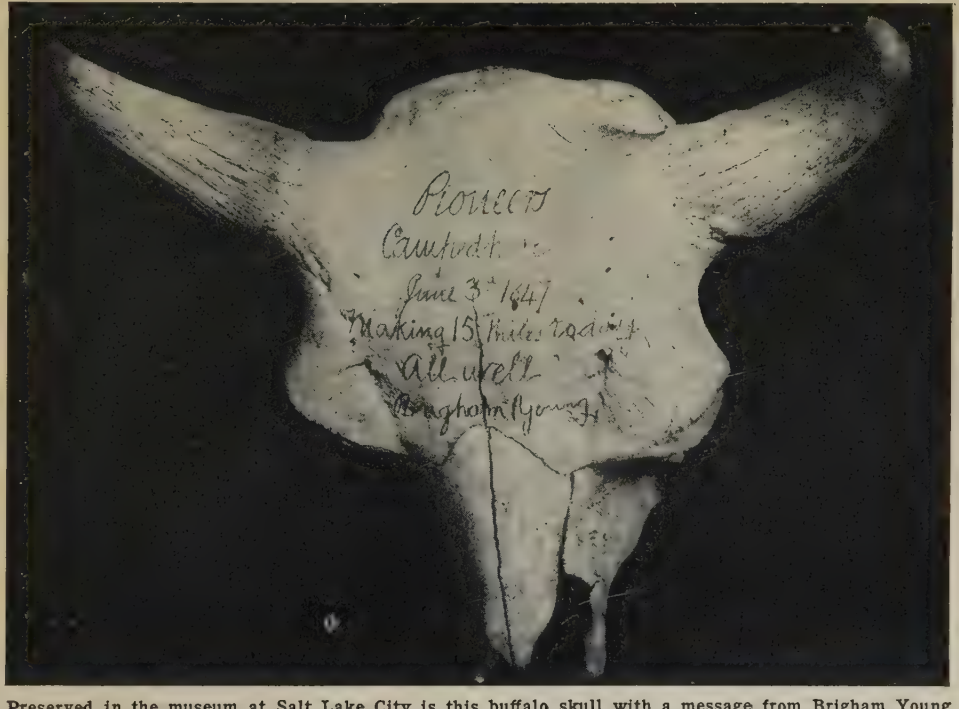
States admitted to the Union after Texas

Now let us see what states were admitted to the Union after Texas. Iowa was the first, in December, 1846, followed by Wisconsin in May, 1848, both as free states. Then came California in September, 1850, also free. There was little more slave territory out of which to make states. So, in May, 1858, Minnesota, and in February, 1859, Oregon, came in as free states. The South made a strong effort to have Kansas made a slave state

MID-CENTURY MEMORIALS



This is Sutter's Fort at Sacramento, California. In 1839 a fort called New Helvetia was built by Captain John A. Sutter on a tract of land granted to him by the Mexican Government. When gold was discovered in California in 1848, this was the first point chosen by miners from the East, and the village of Sacramento was started. Sutter's Fort, rebuilt, is now preserved as a memorial of those early days.



Preserved in the museum at Salt Lake City is this buffalo skull with a message from Brigham Young cut into it. When he and his band were crossing the plains they left advice and information along the way for other Mormons who would follow. The messages were on guide-posts that they set up, or sometimes on whitened animal bones. Wagon wheels were greased with the fat of wolves that were killed.

Photos by De Cou, copyright by Ewing Galloway, New York.

but failed, and in January, 1861, just before the Civil War began, Kansas became a free state. We shall tell you more about the struggle for Kansas in our next story, which will tell also how the South, finding it could not keep the number of slave states equal to the free states, tried to leave the Union.

Now let us look back over the growth of the West. We saw that Vermont, Kentucky, Tennessee and Ohio were once western states, that the Louisiana Purchase made the land beyond the Mississippi the West. Then we gained two other great pieces of territory which carried our country to the Pacific. One of them, called Oregon, we gained by discovery, exploration and settlement; the other, the Mexican territory, by conquest and purchase.

Much of this territory seemed useless at the time we got it. Few people thought that the Oregon country was really worth having, and much of the Mexican territory has remained a desert to the present day. We are just learning, however, that much of the soil needs only water to make it very fertile. Therefore, the government is building dams in the mountains, so that the people may preserve the water of the melting snow and use it as it is needed, instead of allowing it to run away in waste.

HARDSHIPS OF LIFE ON THE PLAINS

Into the land beyond the Mississippi the people went, suffering many hardships and risking their lives in many ways. Beside the great roads, which the wagons followed, were seen the bones of horses, oxen and men who had died on the way from hunger and thirst, from exhaustion, or from the attacks of Indians. Some of the land they crossed seemed a hopeless desert then, though it is now being made fertile by bringing water to it.

Santa Barbara Mission, on the edge of the city of Santa Barbara, is one of the best examples of the old "mission style" of building. Strongly rebuilt after an earthquake in 1812 and carefully cherished, the old church has been kept in use for services. During the earthquake of 1925 the bell towers crashed down.

These western pioneers and their descendants wrested the land from the wild beasts and the Indians, and have made a civilized country of it. Where a few thousand Indians once lived there are now many millions of people. Broad ranches, fertile farms and great cities now occupy the country where buffalo herds made the only roads there were. Of course, the railroads have had much to do with this growth.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 2087.

The sabre-toothed tiger of the Pleistocene Period.

THE PLIOCENE AND THE PLEISTOCENE

CONTINUED FROM 1785

THE Pliocene, the last division of the Tertiary system, and the Pleistocene, the first division of the Quaternary, are best considered together, for though man is essentially a creature of the Quaternary (or Fourth), he seems to have made his appearance as a tool-using animal in the Pliocene.

Geologically speaking, the Pliocene Period is not very well defined, though during it the earth passed through a good many changes which gradually brought it to its present shape and form.

The animals were much the same as in the preceding period; no very interesting creatures, except man (and perhaps we should add the dolphin, the first of the marine mammals), have been found in the rocks. But man himself is, of course, quite sufficient to give distinction to any era, and the discovery of flint weapons and skulls in the Pliocene rocks shows that man then walked the earth.

With the Pleistocene Period we reach the first section of the Quaternary, in which we are now living. Between this and the Pliocene there is often no very sharp line of division, but the Pleistocene is distinguished by the remarkable climatic changes which occurred, transforming whole continents into fields of ice. For this reason it is often called the Ice Age.

Even toward the end of the Pliocene the climate of the earth was slowly growing colder, and during the Pleistocene the cold increased to such an extent that much of the earth became buried under ice. A great ice-sheet covered England, filled the basins of the North Sea and the Baltic, and extended through Middle Europe as far as Silesia, Galicia and Poland. Enormous glaciers filled the Alpine valleys, and descended from the Pyrenees into Spain, while glaciers penetrated even into the heart of France. Practically all of Canada was under an ice-sheet, at least two miles thick in places. In the United States the ice covered New England, New York, northern New Jersey and Pennsylvania, and most of the region between the Ohio and the Missouri rivers. In the Far West there was another ice-sheet.

These arctic conditions passed away and the climate grew milder, but the abatement was only temporary, and again a period of ice and snow set in. It seems indeed likely that there were several glacial periods separated by intervals of warmer climate; certainly there are indications that the ice and snow alternately advanced and re-

LIFE AND REMAINS OF THE PLIOCENE

In this picture-diagram our artist shows a landscape of the Pliocene Period. Among animals are the straight-tusked elephant, the sabre-toothed tiger, and the hippopotamus, with the hipparion, an ancestor of the horse. Man first appeared in this age, and primitive man is shown armed with a club and a stone.

In this picture are seen fossil remains of the creatures of the Pliocene Period. Especially we may note the skull of the hipparion, and flints showing the work of primitive man.

LIFE AND REMAINS OF THE PLEISTOCENE

This picture-diagram shows a landscape of the Pleistocene Period during one of the glacial periods. We see the great mammoth, the woolly rhinoceros, the reindeer, the cave bear, and other creatures of that period, and primitive man is shown clad in skins flaking a flint and cooking his food at a fire.

In this picture we see the remains of animals of the Pleistocene Period. Our artist has shown the great tusks of a mammoth, while well-worked flints and a human jawbone point to the presence of man.

treated more than once before they finally retired to the North.

THE MIGHTY GLACIERS MOLDING THE ROCKS WHILE MAN WAS GROWING UP

In Europe the great distributing centre of the ice and snow seems to have been Scandinavia. From the high table-lands there the ice advanced over Europe in all directions, but the ice-sheet covering Great Britain, though joined with the Scandinavian ice-sheet, was independent, and slid down its own mountains and valleys. In the Scottish Highlands the ice-sheet was tremendous, and filled up valleys and lakes and fiords, accumulating to a height of 4,000 or 5,000 feet. Mountains 3,000 feet high with deep lakes at their bases show marks of ice up to their summits.

In Canada there seem to have been three separate sheets which ran together, called the Labrador, the Keewatin and the Cordilleran sheets. All of them came down into the United States.

As all these enormous ice-fields and glaciers moved along they effected considerable geological changes. Huge masses of moving ice ground up the rocks over which they passed, and converted their surface layers into a mixture of clay, sand and stones known as boulder clay. As they carried the boulder clay along with them the sand and stones acted like great sheets of emery paper, and still further ground down the rocks. The glaciers even scoured over the floors of seas and lakes, and carried shells of shell-fish in their further journey overland.

There can be no doubt that the moving ice-sheets wore down the rocks to a considerable extent. We find everywhere rocks scratched, eroded and polished, and the great masses of boulder clay suggest that enormous destruction occurred. Not only were rocks worn down, but they were often broken off, crumpled and bent by the weight and pressure of the ice. Thousands of lakes in Canada and the United States owe their origin to the ice-sheets. On the other hand, many lakes which existed during the period have now disappeared. The Great Lakes, once larger than at present, are of glacial origin.

When the ice-field and the glaciers melted they naturally gave rise to streams and torrents whose rushing water continued the work of destruction. The direction of many streams was changed. Many of the waterfalls which now furnish power go back to glacial times. How long since the ice-sheet receded we can only guess. Few scientists think it was less than twenty-five thousand years.

THE PERILOUS DAYS OF MAN WHEN TIGERS ROAMED THE HILLS

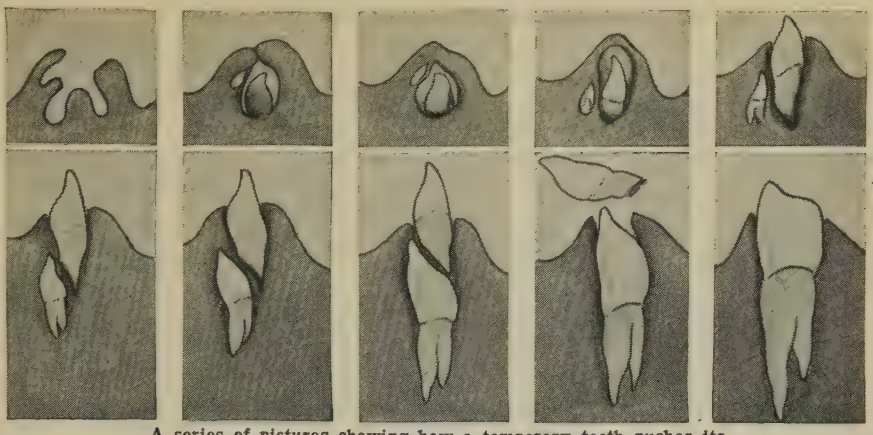
Through all these changes man persisted, for many flints, tools and weapons are found in Pleistocene rocks, and the skulls of the Piltdown, the Heidelberg and the Rhodesian man belonged to this period. He must have had a hard fight for his life, but he managed to survive. He had to fight not only the glaciers but against the many formidable animals that then roamed the world. In this period the English Channel and the Irish Sea and the North Sea were all dry land and Britain was joined to the Continent. The whole of northwestern Europe was overrun with elephants, mammoths, the woolly rhinoceros and the hippopotamus. Bears and hyenas were particularly plentiful in England. There were also great herds of reindeer, elk, bison, red deer and wild horses. All these man must have fought and hunted, and in the caves of the Dordogne Valley in France are found the bones of reindeer, elk, bison and other animals killed and eaten by the cave-men of those days. Even mammoths and boars fell a victim to the fearless hunters, for their bones are also found in the cave larders, sometimes along with skillful sketches of the animals. Some of these are reproduced on pages 190 and 191

THE SHAPING OF THE EARTH STILL GOING ON AROUND US

The Pleistocene Period shades gradually into what we call the Recent or Human Age, and all the time there have been changes and redistributions of life. The mammoth has disappeared from America, the sabre-toothed tiger has gone, the elephants have departed from Europe. Such changes are still slowly going on. The wolf, among other animals, is doomed to extinction; even races of men are disappearing. Some animals are increasing in numbers and others are changing their haunts or habits.

The surface of the earth, though in its larger features much the same through the Quaternary, has also been changing. It is changing still: the mountains are still being worn down into the sea, and under the sea new mountain ranges may still be forming.

THE NEXT STORY OF THE EARTH IS ON PAGE 2069.



A series of pictures showing how a temporary tooth pushes its way through the gum and is followed by a permanent tooth.

THE MOUTH AND THE TEETH

CONTINUED FROM 1805

AS every living thing burns, every living thing must feed, or its body will be consumed. This is true equally of plants and of animals. In the humblest animals, such as the ameba, the eating is done by any part of the surface of the cell—which is the whole body of the animal; but in the higher forms of animal life we find a permanent mouth appearing as a part of the animal's body. When we come still higher, to the animals that have backbones, there is never any mistaking the mouth. These animals, we know, have their bones or skeletons inside their bodies, whereas some of the animals without a backbone, like the lobster, have their skeletons outside their bodies.

The backboned animals have heads consisting of two parts which we can always distinguish—the skull and the face. The face has openings in it for the entry of air and food—openings which we call nose and mouth; and the bony skeleton of the face always includes two strong, bony arrangements which we call jaws. The upper jaw is always fixed to the rest of the face and skull. We never move our upper jaw when we speak or bite; we can move it only as part of the whole head. But the lower jaw hangs from the skull and is movable. The jaws are very strong, and the movement of the lower jaw upward is controlled by very strong and large muscles, for purposes of biting. Further, whether the food is grass or the body of some other animal, it must be torn, cut and crushed, and so we find that there appear in the jaws things called teeth. These appear first in fishes, and it is clear that they really develop from an infolding of the skin round the mouth. They are really skin structures, like nails. But in the course of animal development they became fixed in the jaws.

Teeth are of many different kinds. Some are for catching and tearing, like the long teeth of the dog and cat; others are for spearing, like the long teeth of the elephant, which we call its tusks, and the beautiful hard outside of which they call ivory. Others are for poisoning, like the poison-teeth of snakes, which have a channel running through them or on their undersurface for the poison which the snake makes in glands below and beside its lower jaw. And most of the animals that have teeth at all have teeth for crunching, munching and grinding.

These are usually in the back part of the jaws, of course, while the sharp teeth that catch or bite, or spear or poison, are in front, where they will be most useful.

The teeth of different kinds of animals can tell us a great deal about the habits of the animal the jaws belong to, even if we have nothing else to go by. You would not expect a cow to have the same kind of teeth as a tiger. Their food is entirely different. The study of the teeth of animals is of great value in understanding how animals are arranged in classes. They also help to show how different kinds of animals are related to one another. All human beings have the same number of teeth—to begin with—and the teeth are of exactly the same kind, and the same number of each kind.

The history of our two sets of teeth and their names

As everyone knows, we have two sets of teeth. In the first set we have twenty, and in the second set thirty-two. The first teeth of the first set begin to appear about the sixth or seventh month after we are born. The first teeth of the second set begin to appear at about the age of six; and the last four of the thirty-two do not show above the gums until we are nearly grown up. By that time we are supposed to be wise, so they are called wisdom teeth. The number of teeth in each jaw, and on each side of each jaw, is the same. The flat front teeth are called *incisors,* or cutters; the corner teeth are called *canines,* because these are the teeth so big in dogs; and we may call all the rest *molars,* or grinders, though the two teeth next behind the canines are often called *pre-molars.* The last molar on each side of the two jaws is a wisdom tooth. There is no doubt that the teeth and jaws of human beings are growing smaller and weaker. In many people the wisdom teeth never appear at all.

The reason that teeth are getting less and less important is that man gives up, one after another, his animal ways of doing things. He no longer eats rough and fibrous food. We can choose and cook our food, and though good teeth are always a blessing, yet people may live happy and useful lives even though they have lost all their teeth. When a wild animal loses its teeth it generally starves.

Why our teeth are not set exactly opposite each other

The teeth of upper and lower jaws are not set exactly opposite each other. Thus, if a tooth is lost, the tooth that corresponds to it in the other jaw is not made entirely useless for the rest of the person's life. It still meets part of a tooth next to the one that has been lost. This peculiarity is a most valuable one; but for it, to lose one tooth would mean really losing two. When our teeth are formed, they do not grow any more. If they are properly used, they remain healthy. This principle is true of every part of every living thing, and it is important that we should understand how to keep our teeth in good condition.

Animals that live on other animals always have sharp, tearing, long teeth. These animals are called carnivorous, or flesh-eating. Animals that live on grass, and so on, are called herbivorous, or herb-eating. They often have no tearing teeth at all, but merely munching, grinding teeth. An animal like a rabbit, which is a rodent, or gnawer, has gnawing teeth. Our own teeth are not exactly like any of these.

All sound teeth are completely covered, in all the part that shows above the gum, by a layer of what we call *enamel.* This enamel has no nerves in it, and therefore cannot feel. The case is quite different, however, when any part of the enamel of the tooth has been slowly eaten away by the acids which microbes produce in our mouths, or when a tooth is broken. The part of the tooth underneath the enamel is called the *dentine.* It is much softer than the enamel, so that things can pierce some little distance into it, and it is filled with tiny branches of the nerve that goes to each tooth. These nerve-ends are not disturbed by most of the things we eat, but sugar is one of the things that excite them, and so, if any of our teeth have their dentine exposed, we are liable to get toothache.

Very often it may be only one tooth that has its dentine exposed, yet the whole of that side of the jaw, or nearly the whole of it, may ache. The reason is that all the nerves going to the teeth along one side of either jaw are branches of one nerve, and when any part of it is disturbed, all the teeth to which its branches are distributed are likely to become the seat of pain.

WHY ANIMALS AND SAVAGES HAVE SUCH BEAUTIFUL TEETH

Only very rarely indeed do the teeth of animals decay, and among savages the teeth do not decay so frequently as among civilized men. Our teeth are very different from those of savages, and there must be something in our way of life to explain this. In the first place, the teeth of many of us are not well made to begin with. The enamel is thin and soft and not smooth enough, so that it cannot resist damage so well as it should. The reason is probably that many of us are not properly fed when we are babies. Perhaps our mothers could not feed us, and we were fed on food which was thought to be good but really was not. Babies and children who get plenty of fresh milk—and a little cream, too—have better teeth when they grow up than other people. And another cause of the decay of our teeth is the kind of food we eat. Animals and savages eat very hard and fibrous food, while some of us actually cut the crust off toast. If we give our teeth no work to do, they are bound to become weak, for it is a universal law of all life that anything which is not used, or has its work done for it, gets weak and helpless.

Here is the mouth, showing upper and lower jaws. There are sixteen teeth in each row. The four front teeth are called incisors. On each side of these is a canine tooth; next to the canines are five molars, the last one on each side being known as a wisdom tooth.

We should take care of our teeth by not forgetting to give them work to do. We should not be afraid to use our teeth on food instead of cutting it up too much with knives. Then we must be sure, every day of our lives, and especially at night, to keep our mouths clean. If we do not do this, microbes will grow in our mouths and will form acids, especially one called lactic acid, such as is found in sour milk, which is able slowly to dissolve the chalk in the enamel of our teeth. Our saliva fortunately interferes with this acid by using it up, since our saliva contains what is called an alkali. An alkali, when it meets an acid, combines with it. It is better that the acid should combine with the alkali of the saliva than with the alkaline chalk of the teeth. So we should keep our mouths and teeth clean by using a tooth powder which is alkaline and is also antiseptic, that is, poisonous to microbes. We should use this powder night and morning. We should not use too hard a toothbrush, which may wear away the teeth or make the gums bleed, and we should move the toothbrush up and down, so as to clear the spaces between the teeth, and not from side to side.

Most dentists say that a powder is better to use for the teeth than a liquid, provided it is a perfectly soft powder, without any grit that would scratch the enamel. A powder is best because it helps, by mere rubbing, to keep the teeth free from the brown stuff, called "tartar," which is likely to cling to them.

The lips are very interesting and important. They should meet so that the mouth is closed except when we eat or speak. The mouth is not meant for breathing. The lips are very richly supplied with nerves. Their rich supply of nerves makes them sensitive. This is valuable because the lips are the guardians of this entrance to the body. Grit, prickly things, and anything that is not fit for food is delicately felt and recognized by them, and they close and refuse to allow the unsuitable thing to enter, or else spit it out. It is very interesting and instructive, in the case of small children, though it may annoy their parents, to see how quickly their lips detect and reject anything they do not think suitable to swallow.

The lips are lined with very thin and delicate skin, and as this passes into the mouth it changes into another kind of surface called a *mucous membrane*. The lining of the mouth—and of most of the interior surfaces of the body—is called by this name, because it produces a smooth thickish stuff called mucus. This is a most valuable material, though it is rather troublesome when we have a cold and our noses produce too much of it. It catches microbes, so that they do not penetrate beneath it; and it is slightly antiseptic. It catches dust, too. Because

of it, the inner surface of the lip and the surface of the gum move smoothly and easily against each other and do not stick. It is thus like the lubricating oil that is put into machinery so that it may work smoothly. Also it covers over our food before we swallow it, so that it slides down smoothly and easily.

The production of mucus by the mucous membrane of the mouth is under the control of the nervous system, and can be disturbed by worry or fear so that the mouth becomes dry and we can hardly swallow. Long ago in India when one of a number of people was suspected of having stolen something, they were all made to take a mouthful of some dry food, like grain or rice, and told to swallow it. The idea was that the brain of the guilty person would be frightened and upset. Therefore he could not produce enough mucus to soften and coat his mouthful. The consequence would be that he could not swallow it. This was taken as a proof of guilt.

WHAT HAPPENS TO FOOD BEFORE IT CAN BRING STRENGTH

Into the mouth there also pours, when we eat, or see something we want to eat, a quantity of a very watery fluid quite different from mucus which is called *saliva.* That is why we say our "mouth waters" when we see something nice. Saliva is produced not in the mouth, but in special glands that lie in front of the ear and also under the jaw. They are called salivary glands, and in poisonous serpents they produce the poison. The teeth that lie nearest the openings of these glands are usually the last to decay, since saliva is alkaline and combines with the acids that would destroy the teeth, and so they are saved.

We have learned that saliva is very important indeed. It not merely softens the food, but also contains a special ferment, a very complicated chemical substance which has the power of turning starch into sugar. It can do nothing else; but there is starchy material in most of our food, and this starch must be fermented into sugar before it can be used by the body. In fermenting, it is made into a liquid. This helps to break up the food so that the rest can be more easily digested—that is, fermented—when it reaches the stomach. This is very important, and we shall tell you about it now instead of waiting till later.

HOW TO EAT—A THING THAT EVERYONE SHOULD KNOW

If we bolt our food we lose the value of much of it and often get indigestion. On the other hand, if we chew our food thoroughly, we get plenty of saliva into our mouths. It has been proved that chewing brings the saliva into our mouths; indeed, we can notice this for ourselves.

As we chew, saliva and food get mixed together; then a round lump of the mixture gets smoothly coated with mucus. It is *now* ready to be swallowed, but not before. When it reaches the stomach the starch is digested by the saliva and turned into sugar. In this form it can be taken into the blood and used to give us warmth and strength. The digestion or fermentation takes place in the stomach, but the salivary glands produce the ferment that does the digestion. Therefore this is the one part of the business of digesting our food that we have under our own control, for we can chew or not, as we please.

If this first stage in digestion is properly carried out, it helps all the rest. The melting-out of the starch from among the food enables the juices of the stomach to get at the rest of it. In everyone but those who are really ill the whole business of digestion will go on well and easily if we have been wise enough to start it rightly by choosing proper food and chewing it properly. Everyone should know this, and every child should learn to chew and make a habit of chewing.

THE TONGUE, WHICH HELPS US TO EAT AND TO SPEAK

In studying the mouth we find, besides the lips that bind it, the mucous membrane that lines it, the teeth that arm it, and the saliva that pours into it, another wonderful organ—the tongue.

There is almost no end to the usefulness of the tongue. That is true of the tongues of the lower animals; but it is still more true of our tongues, as they are used by us for speaking. So important is the tongue as an organ of speech that we often say a "foreign tongue" when we mean a foreign language. Even when we say language we refer to the tongue, for *lingua* is the Latin word for tongue.

The tongue is really a group of muscles —some running along it from root to tip, some running across it, and so on. Any

of these muscles can be used apart from the others, or in combination with them, so that we can move the whole tongue in any direction. We can lengthen it or shorten it; we can hollow it out to make a loud noise as a baby does when it cries, and as every good singer has to learn to do. We can make it arch itself like the back of a cat, as we do when we pronounce the vowel *e*. It is one of the most remarkable things about our bodies that we can use for special human purposes, like speaking, organs which the lower animals have. For the tongue's most ancient uses, to which we still put it, are quite different. It searches the mouth and finds the food in it. In some animals, like monkeys, that have cheek-pouches, it stows the food away till it is wanted.

The tongue is used every time we swallow. It is the clever tongue that moves the food about so that it shall be properly caught between the various teeth, and cut up and chewed. It is the tongue that rolls a portion of a mouthful into a round ball, slips it on to its own surface, far back, and then tosses it into the throat, where it is swallowed. Try to eat or to swallow without moving your tongue and you will find how useful it is.

The tongue, too, keeps the mouth clean and free from anything it does not want to swallow. It is the tongue that discovers the bone in the fish, and catches it and pushes it to the lips so that we can get rid of it. So, like the lips themselves, it is a sort of sentinel, letting pass into the interior of the body only what it thinks ought to be swallowed.

But, beyond all these other uses, the tongue is wonderful because it is the organ of taste. It is covered with special little points to which the nerves of taste run from the brain. These *taste-bulbs*, as they are called, are most abundant on the sides of the tongue and at its tip. They are much fewer on the back of the tongue, which is used more for rolling and throwing the food into the throat. Different parts of the tongue are different in their sensitiveness to different kinds of taste. There seem to be four principal kinds of taste, and it may be that there are special nerves, and perhaps special taste-bulbs, in the tongue for each of these kinds. They are acid, bitter, sweet and salt.

The tongue, showing taste-bulbs and the areas sensitive to bitter, acid and sweet.

We may notice that two of the classes of taste, acid and salt, correspond to two great classes of chemical compounds. Sweet corresponds to the compounds called sugars; and bitter things perhaps belong to a special chemical class, too. We must never confuse acid with bitter, as many people do. There is no resemblance between the taste of a lemon, which is acid, and the taste of quinine, which is bitter.

The tongue, then, besides being the principal organ of speech in human beings, is the organ of taste, and we should know what the use of the sense of taste is. We usually think of it as if it were just meant to give us pleasure. But none of our senses exists in the first place to give us pleasure.

Thus the tongue is a sentinel, because it is the organ of taste as well as of touch, and can feel things, like bones, that it would hurt us to swallow. It is a sentinel chemically, because it tells us by taste, what we require to know regarding the chemical composition of our food. It recognizes sugar and approves of it, because sugar is good for us. It recognizes the things which are made in food when food goes bad, tells us they are there, and that they might harm us. Lastly, the mouth and tongue have the business of swallowing.

THE NEXT STORY OF OUR OWN LIFE IS ON PAGE 2083.

THE OPEN-PIT MINE FROM WHICH THE ORE COMES

More than half of the iron ore mined in North America comes from the open-pit mines of the Lake Superior region. The deposits are sometimes three hundred feet deep and seem almost inexhaustible. Here you see a steam shovel digging into a bank of ore in Minnesota, and loading the cars. The ore is not hard but is like a rotten stone you sometimes see. In another place we show the steam shovel at work digging the Panama Canal. One of these machines does more work than a thousand men could do with picks and shovels. In the next pictures we shall follow the ore to the furnace and see what happens.

Pictures on pages 1934, 1941, 1944, top, 1946, 1946, top, 1948, 1950-53, courtesy of the Illinois Steel Company.

A great modern ironworks, showing the furnaces and the wharf at which the iron ore is landed.

MAKING IRON AND STEEL

THE WONDERFUL SIGHT IN THE GREAT FURNACES

CONTINUED FROM 1802

PERHAPS the boys and girls of to-day do not realize that people did not always have high buildings like those we see around us everywhere, nor such great steel bridges as now span our rivers. Our ocean steamships are gigantic affairs compared with those of former times. So, too, our powerful machinery, steel rails and cars, and many other things made of iron and steel, are all bigger and better than those used not so long ago. This all comes about because of the improvements in the making of iron and steel.

Iron and steel are now the commonest and cheapest of all the metals. This was not always so. The metals gold, silver and copper were used by the ancients long before anything was known of iron. I think you will easily see why this was so when I tell you that iron is almost never found in a native state as we find gold, silver and copper. Very rarely, almost pure iron is found in rocks which show evidences of great heat, and some meteorites which drop from the skies have iron in them. A man might dig for a lifetime deep down into the earth and never come across any pure iron. This is because it is almost always found in combination with some other element and must be reduced in order to be of any use to us. Now, the Greeks had discovered how to reduce the ore to make iron, and no doubt the Romans learned from them. The people of Great Britain, too, had found a way to produce iron, for when the Romans came to England they found ironworks in the Forest of Dean.

Of course the methods of all these people were crude and primitive when compared with our way of doing it to-day. You know that in order to reduce the ore to iron it must be placed in a furnace with fuel and a blast of air strong enough to increase the heat until the ore melts. The Greek and the Roman way was to heat the ore to a melting-point in a furnace which was nothing more than a pit surrounded by walls of clay about a foot high. The fuel for this crude furnace was charcoal. Layers of broken iron ore and charcoal were placed alternately in the furnace until

the hole was filled, when a layer of charcoal was heaped over all. A rude form of bellows made from skins furnished the blast. After some hours of firing, the melted ore and cinders were found in a lump at the bottom of the furnace. As the cinders were lighter than the ore, they settled on top of the mass. The iron-worker broke off this cinder lump, and what remained was iron. The iron made in this way was very good indeed, but the great cinder heaps left in Yorkshire by the Romans show us that much good material was wasted. In fact, the cinder heaps contained so much iron that they served as ore for twenty furnaces working constantly for about three centuries.

THE FIRST IRON MADE IN AMERICA AT JAMESTOWN

In the year 1624 a little colony of Englishmen living at Jamestown, Virginia, built furnaces there on the banks of Falling Creek, and produced the first iron made on this continent. This started the iron production in America, and later it was taken up by the people of Massachusetts, Connecticut and Rhode Island, for much "bog" and "pond" ore was found in these eastern states. Furnaces were built at that time close to the source of the iron ore and the forests which served or furnished the fuel. Iron ore was found in several other colonies, and iron was soon common in the New World.

As I have told you, charcoal, or burnt wood, was the only fuel used at that time. The English were alarmed at the rapid destruction of their forests, and asked what they would do for fuel for their furnaces when the timber was all used up, in much the same way as we are asking to-day what we shall do for fuel when our coal-fields give out. They were forced to look for something to take the place of charcoal. Coal was suggested as a substitute, but people laughed at the idea that coal could do the work of heating the furnace as well as charcoal.

WHY COAL DID NOT MAKE GOOD IRON AT FIRST

Coal had already been tried for the smelting of iron, but the plan was not understood. We know now that it failed because coal was too soft to stand the weight of the iron ore placed upon it. The weight packed the coal so tight that the air could not find its way through the mass. The coal could not burn fast enough to produce a high temperature during the smelting process. However, during the process it was observed that much of the coal that was heated burned into coke. This coke showed the power to hold up the ore without being crushed, the very thing that coal was unable to do. From that time coke was the fuel, and remains the fuel to-day, for smelting ores.

In the United States, however, the conditions were different. The forests were large and afforded plenty of wood for making charcoal. In fact, it was so plentiful that charcoal was used here for fifty years after the English had begun to use coal, and the product from such furnaces was so much better than that of the coal furnaces that the Americans were encouraged to ship their charcoal iron-metal to England. In time, though, the Americans were forced to face the same problem about their wood as the English had met. Fortunately, at about this time coal came into common use in the new country, and soon attention was turned to manufacturing it into coke for use in the growing iron industry.

In 1819, and again in 1841, the attempt had been made, but it did not meet with success. To encourage experimenting, in 1835 the Franklin Institute of Pennsylvania offered a premium of a gold medal to the person who during the year could manufacture in the United States the greatest quantity of iron from ore, using no other fuel than bituminous coal.

THE COAL AND IRON BELT—WHERE THE COAL AND IRON ARE FOUND

The greatest iron-ore region in this continent lies near the shores of Lake Superior. The picture here shows an open-pit iron-mine of the famous Mesaba Range near Lake Superior in Minnesota. One can see how readily the ore can be taken from the open pit by steam shovels and deposited at once in the cars. These deposits are three hundred feet deep in some places. A single mine in Minnesota is said to have produced 1,681,000 long tons in one year—more than was produced in all America before 1854. One would naturally expect the iron industry to be placed near these pits, but this is not always the case. Pennsylvania, Ohio, Illinois, New York and the Virginias, where less iron is found, are great iron-manufacturing sections, and much iron ore must be shipped

LOADING IRON ORE ONTO A STEAMER ON LAKE SUPERIOR

On page 1934 you see the great steam shovels taking the ore from the earth in the Mesabi range and loading it into cars. A whole train of ore cars has been brought to a dock at Duluth. The bottoms of the cars are so made that they can be opened and the ore slides down the chute into the great ore steamer lying beside the dock. From here it will be carried to the blast furnaces and there unloaded by machinery.

from ports on the shores of Lake Superior or Newfoundland. Alabama is an exception, for there both coal and iron are found close together. Nova Scotia has much iron, but brings most of the ore from Newfoundland.

If you follow the line of the bituminous-coal belt, from which coke is made, you will see that it runs through the region I have just mentioned. This is called the Appalachian coal belt and is about 800 miles long and about 150 miles wide, and contains within its borders the great centres of the iron and steel industries. In fact, these industries will be found to lie closer to the source of the fuel than to the source of the ore.

How the fuel is made that supplies the great iron furnaces

Success in the iron and steel industries is due to the making of coke out of coal, but not until the year 1880 did the manufacture of coke mean much to the iron industry. Before that time very little coke was made in North America. About that time, making coke out of soft coal in what is called a beehive coke oven attained a position of importance. The name of the oven was no doubt suggested from its resemblance to the ancient dome-shaped beehive.

These ovens have an opening at the top through which five tons or more of coal is dumped. This charge of coal falls on the bottom of the oven and is then lighted by placing shavings of wood on the top of the heap. The process of fusing and coking now begins on the top surface of the charge of coal and goes down through the mass. It takes about forty-eight hours to burn this five tons of coal into coke.

This method is still used, but it wastes some of the most valuable parts of coal, which are driven off in the gases and lost. Ammonia, which is very valuable, is one of them; and the tar from which medicines and colors, as well as many other things are made, is also lost. Sometimes these gases are conducted through a pipe and burned. The latest ovens cook the coal in closed ovens called retorts, and all the valuable gases are saved. There are several kinds of retort ovens in use.

The blast furnace, where the ore is melted

This furnace is the first step in the making of iron and steel, and I shall now tell you something about it. It is a tall cylindrical iron or steel shell, seventy-five or sometimes one hundred feet tall, lined with fire brick on the inside. The fuel for this furnace is coke, which is the blast-furnace fuel everywhere. Nearly all the coke manufactured to-day is burned up to make heat for melting the ore into pig iron.

The descriptions of the blast furnace given under the pictures, and the diagram, will tell you how it is made, and will show you how it works. You will learn, too, that the product of this furnace is pig iron. This is the raw material for the puddling furnace, which produces wrought iron, and for the cupola furnace, which produces cast iron, the Bessemer converter for the making of soft steels, and the open-hearth furnaces for carbon steels, and the crucible furnace for high-carbon or tool steels.

The puddling furnace, which makes one kind of iron

In 1784 Henry Cort invented the puddling furnace for the reducing of pig iron by a coal-heated process. Wrought iron, the product of this furnace, is very tough metal and will stand shocks, but is easily welded. Pig iron as it comes from the blast furnace is put on the platform, or hearth, of the furnace. The fire-box lies in the end of the furnace instead of underneath, and as the fire increases in temperature the burning gases from the coal pass over the iron.

This heats the mass of pig lying upon the hearth. In a little while the iron begins to melt and the slag forms little pools on the bottom of the furnace. In about an hour the puddler stirs the whole mass with a long bar of iron called a rabbling-bar. He keeps the temperature of the metal just below the melting-point. At this temperature iron is in a pasty condition. By rolling it around he forms a ball weighing from 150 to 200 pounds. He is careful to see that the metal does not get too hot, for if it should, it could not be gathered into a ball. So the heat is regulated by opening and closing the damper on top of the chimney. When the ball is made it is taken out of the furnace by the aid of a pair of tongs, is placed on wheels and rushed off to the squeezer, where all the slag (impurities) is squeezed out of it. Then it is put between the rollers and reduced to the proper size. This is called wrought iron,

and is placed on the markets of the world to be sold for making chains, grills, horseshoes, bolts, nuts, car-handles, steps, and the like. It is also used to make crucible steel. It is tough and not brittle like cast iron.

THE CONVERTER THAT CHANGED THE WHOLE HISTORY OF STEEL-MAKING

The pictures and the description tell the story of Sir Henry Bessemer's great invention for changing pig iron into steel without the use of fuel. Molten cast iron is put into the converter. The blast added to the heat already in the cast iron increases the heat enough to burn all the impurities out of the molten mass, and most of the carbon as well. Since good steel must have some carbon, the right proportion is put back into the molten steel. This makes a steel that is used for building material, bridges, steel cars, vehicles, railroad rails, fire escapes and grills, and is now replacing wrought iron for many things. It has no fibre like that of wrought iron, but can be twisted, bent, drawn out and shaped to any desired form without danger of breaking. Many blacksmiths prefer this steel to wrought iron for their work. This was the first cheap steel manufactured.

THE FURNACES THAT MAKE STEEL FOR GUNS AND ARMOR PLATE

The product of the open-hearth furnace is a very fine steel, out of which is made armor plate used on war vessels. Large guns are made from this steel, steel casings, large propeller shafts for vessels, crank shafts, and also most of the steel used on automobile forgings are made from this product. When you visit a steel mill where these furnaces are in operation you will see that the charging door is about fifteen or twenty feet above the floor-level. The brickwork below the furnace hearth is built up in a checker system, through which the gases rise and are heated before reaching the melting zone.

The fuel used for the open-hearth furnace is coal-gas. It is the gas that is heated to a white heat on its way to the melting zone. This, you see, keeps the furnace at a very high temperature all the time, for there is no cold air of any kind entering it while it is in operation. In many ways this furnace is the most satisfactory of all mentioned for producing large quantities of steel. The molten metal can be held in it any number of hours, during which time tests can be made until the required carbon point is determined. This assures a constant quality of steel. Sometimes small amounts of other metals are introduced into the steel for special purposes. For example, a very small amount of nickel increases the strength of the steel very much. Several other metals, such as chromium, molybdenum and vanadium, are also used to make steel for motor cars or for machinery where both strength and lightness are necessary.

THE STEEL THAT IS USED FOR THE CUTTING TOOLS OF THE WORLD

Crucible steel is found in the market under four different names. It is sometimes called: (1) crucible steel, because it is melted in a graphite pot, or crucible; (2) high-carbon steel, because it contains more carbon than any of the steels; (3) cast steel, because it is cast into ingots and hammered into shapes for the market; (4) tool steel, because all cutting tools are made from it, including our table cutlery, butcher-knife-blades, pocketknife-blades, files, surgical instruments, and the like.

The method of manufacturing this steel is one of the simplest, yet great care must be exercised during the melting process. Refined iron or soft steel is placed in a crucible with a certain amount of carbon. The crucible is then placed in the melting-pit, which is a hole made in the ground, about four feet deep, lined with fire brick. The fuel for melting the metal in these pots is gas, preheated in the same way as was that of the open-hearth furnace. It takes about three hours for the metal to melt, and during that time the temperature of the furnace reaches 3000° Fahrenheit.

You can see that men who have this kind of work to do must be trained especially for the purpose. Their work-days are only four or five hours long, and during that time they are dressed either in asbestos clothing or in overalls saturated with water. This is done to keep the heat away from their bodies while lifting the pots up from the pits. If they were not strong they could not stand the intense heat. It is the skill required in handling the hot metal just at the right time, and the difficulty in making men fit to do this work, that keep tool steel at the high price asked.

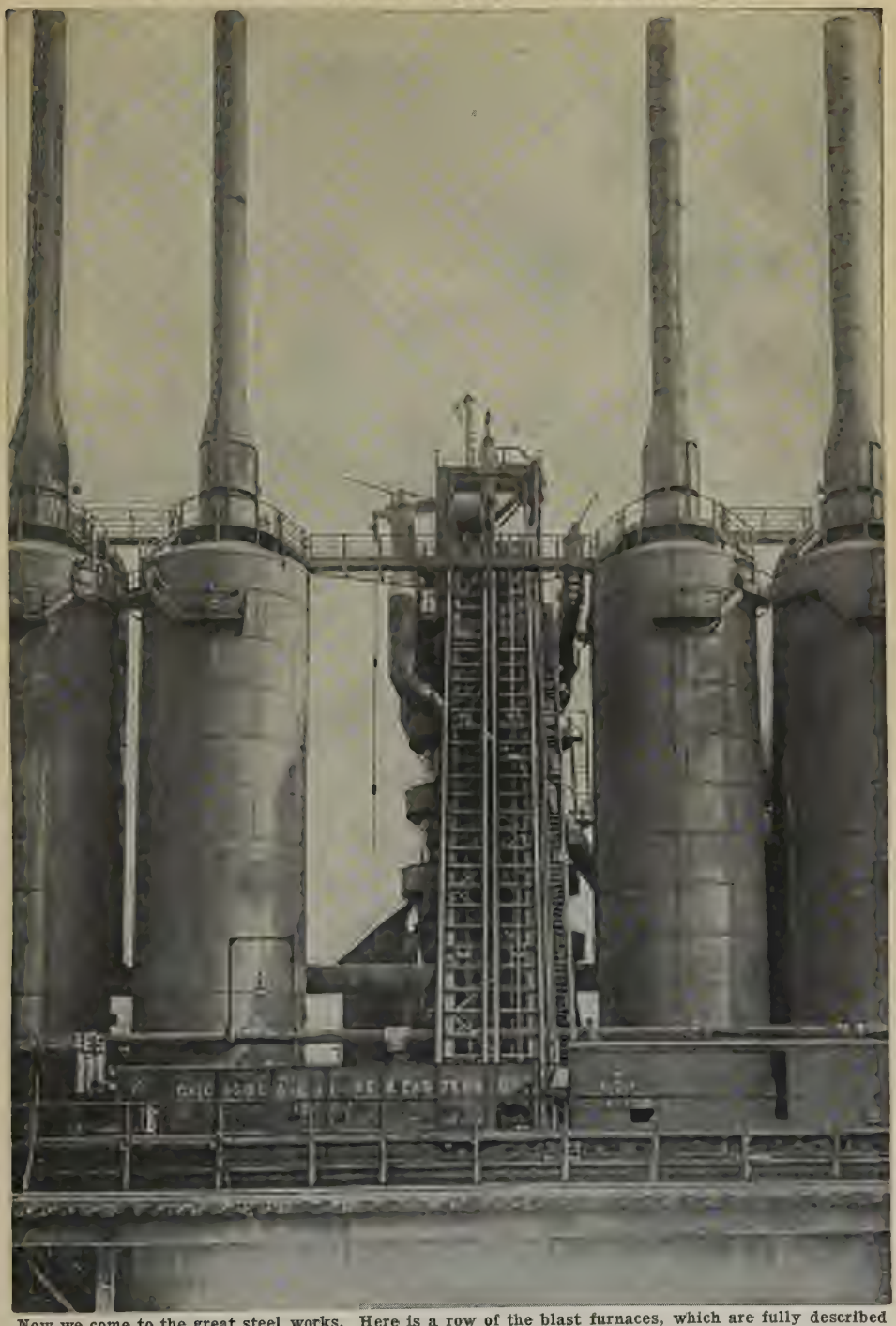
THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 2021.

FOLLOWING THE ORE TO THE FURNACE

The iron ore which we saw the steam shovel loading into the cars is then transferred to great ore ships which carry it across the lake to the furnace. Here we see one of the great ore ships, which is being unloaded. Some large and strong steamers are engaged in carrying ore which is finally to reach the great furnaces in the Middle West or the East.

Think how long it would take to unload one of these ships by means of shovels. This is a close view of the scoops you can see above. When let down into the ship they gather up hundreds of pounds of ore and quickly run along the framework to the place where they dump the load and return for more.

THE GREAT BLAST FURNACES



Now we come to the great steel works. Here is a row of the blast furnaces, which are fully described on other pages, where we show you the top of one and a diagram of the interior of another. In the centre is the hoist which raises the ore, the coke and the limestone from the railway cars at the bottom to the top, where they are fed into the great monsters. Sometimes a great establishment has dozens of these furnaces.

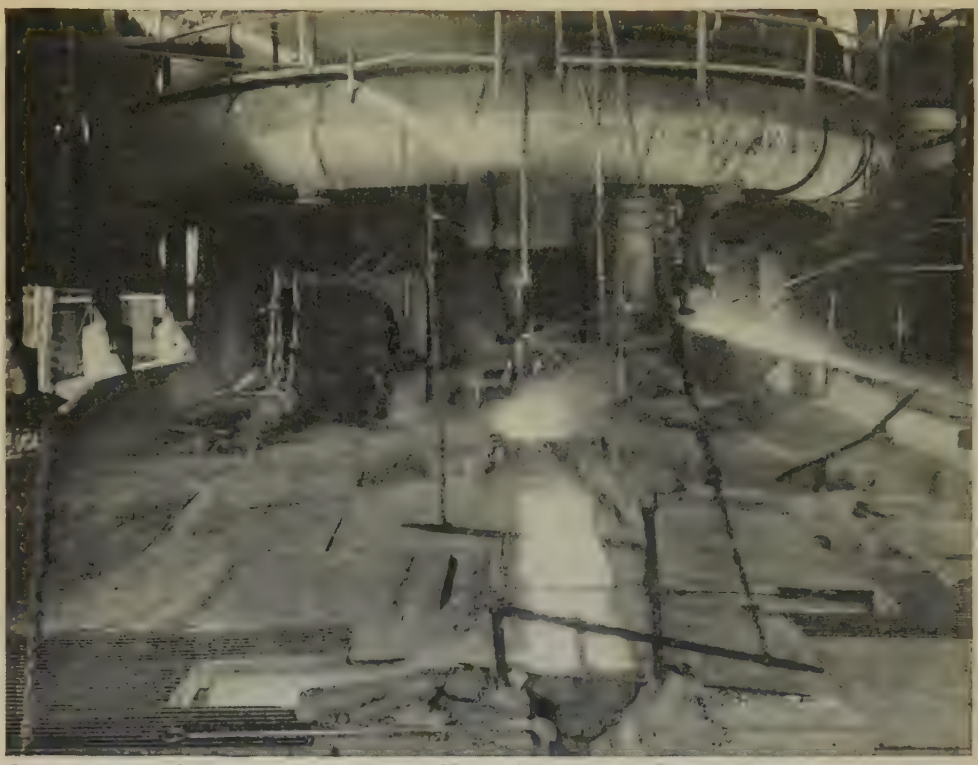
THE TOP OF A MIGHTY BLAST FURNACE

Here we see the top of one of the blast furnaces in which ore is melted. Pig-iron is really cast iron, and it received its name because, when it was run into trenches lying side by side, it was jokingly said to resemble a number of little pigs. The iron ore is pulled to the top of the furnace in great buckets, as shown in the picture. The blast furnaces are often 100 feet high and 125 feet round inside, and each one can produce 700 tons of pig-iron in a day. When the fire is started it is kept going for years, and if by accident it goes out and the molten iron inside becomes solid, the whole furnace must be pulled down.

THE FIRE THAT MELTS IRON

This diagram illustrates the beginning of iron and steel. The ore is carried to the top of the great shaft, in which a huge fire is burning. The lid of the furnace is lowered and the ore falls into the furnace. The lid closes, and the gases rush into the pipe on the right and into the stove, where they help to drive machinery. This machinery, in turn, forces hot air into the bottom of the furnace through the little entrances we see. This hot air rises through the heart of the fiery furnace, and the heat melts the iron out of the ore until it trickles like water. At the bottom of the furnace the melted iron collects, and every few hours the "tap hole" is opened and the white-hot iron runs into the groove along the ground, and from this into other grooves, called "sand molds" because they are cut out in sand.

VARIOUS WAYS OF TREATING IRON

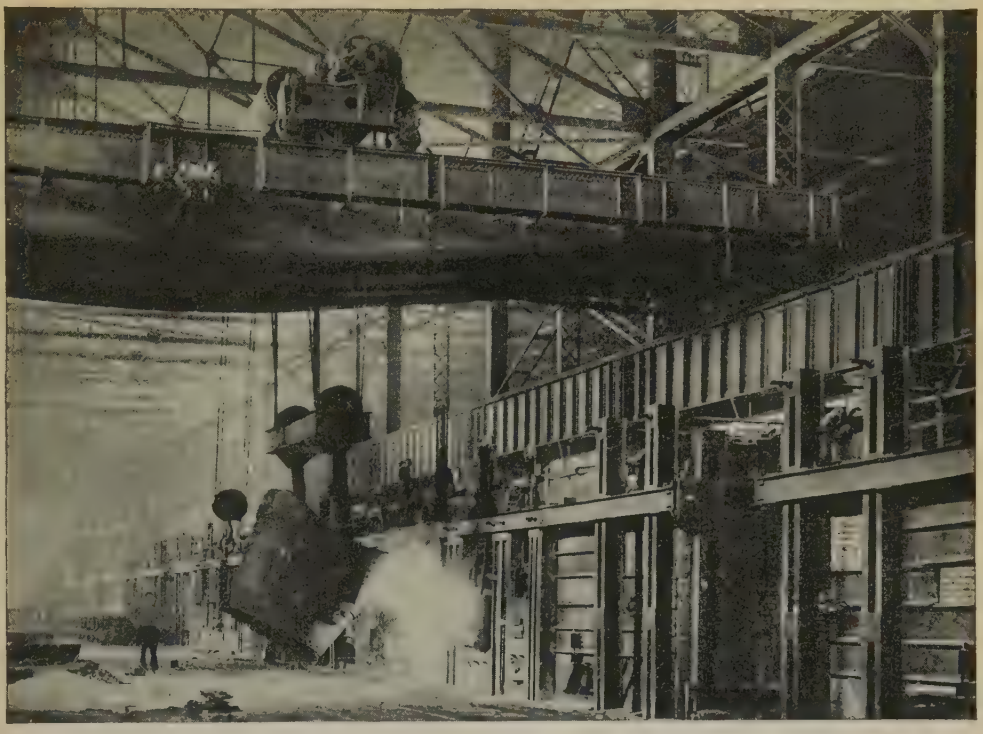


Here we see the bottom of a blast furnace which is being tapped. The blinding stream of white-hot metal is issuing from the furnace, but instead of being allowed to run out into the sand it is being conducted into a great reservoir with iron from several other furnaces, so that the product may be uniform.

Improvements in the manufacture of iron have been marvelous, and a single foundry now produces in one year as much pig-iron as was made by the world a century ago. Here molten pig-iron is being poured into molds from a ladle.

The most advanced ironworks make pig-iron in ingots, as shown in these pictures. Instead of being run into trenches the molten metal is tapped into a great vessel called a ladle, and is poured into a series of molds in a double line.

THE OPEN-HEARTH FURNACE IN OPERATION



The open-hearth furnace, as described in the text, is one method of changing iron into steel. The great ladle hanging from the crane is charging, or filling, an open-hearth furnace with iron.

When the iron in one of these furnaces has had the desired amount of carbon removed it is emptied. Sometimes small quantities of other metals are introduced into the furnace to make alloy steels.

POURING OUT STEEL LIKE WATER

In making steel by the Bessemer process a great pot called a converter is filled with molten iron. Jets of air are introduced, and the oxygen of the air burns up the carbon in a few minutes. A long tongue of blinding flame shoots out from the mouth of the converter with a roar.

The converter works on pivots, and when the steel is ready the converter is turned and the liquid metal is poured into a great ladle as easily as milk is poured into a cup. In this picture we see the steel in process of being poured out. When the metal in the converter is at its greatest heat, the impurities in the iron, known as "slag," float, and are often blown out during the blast as white-hot cinders.

THE BLINDING GLORY OF MOLTEN STEEL

There are few sights more impressive or awe-inspiring than a great steel works when the blast is being blown through the Bessemer converters or the fiery liquid is being poured out into ladles. It is in such a place and at such a time that one realizes the marvelous power and greatness of the mind of man, that can invent and carry out such tremendous processes. Here is liquid fire sufficient to destroy a city and slay ten thousand men if once it got loose, and yet, by sheer power of the human mind, it is under absolute control, and is handled as safely and with as little concern as the housewife handles milk. From this picture we get some idea of the wonder of molten metal.

Pictures on pages 1937, 1947 and 1949, courtesy of United States Steel Corporation.

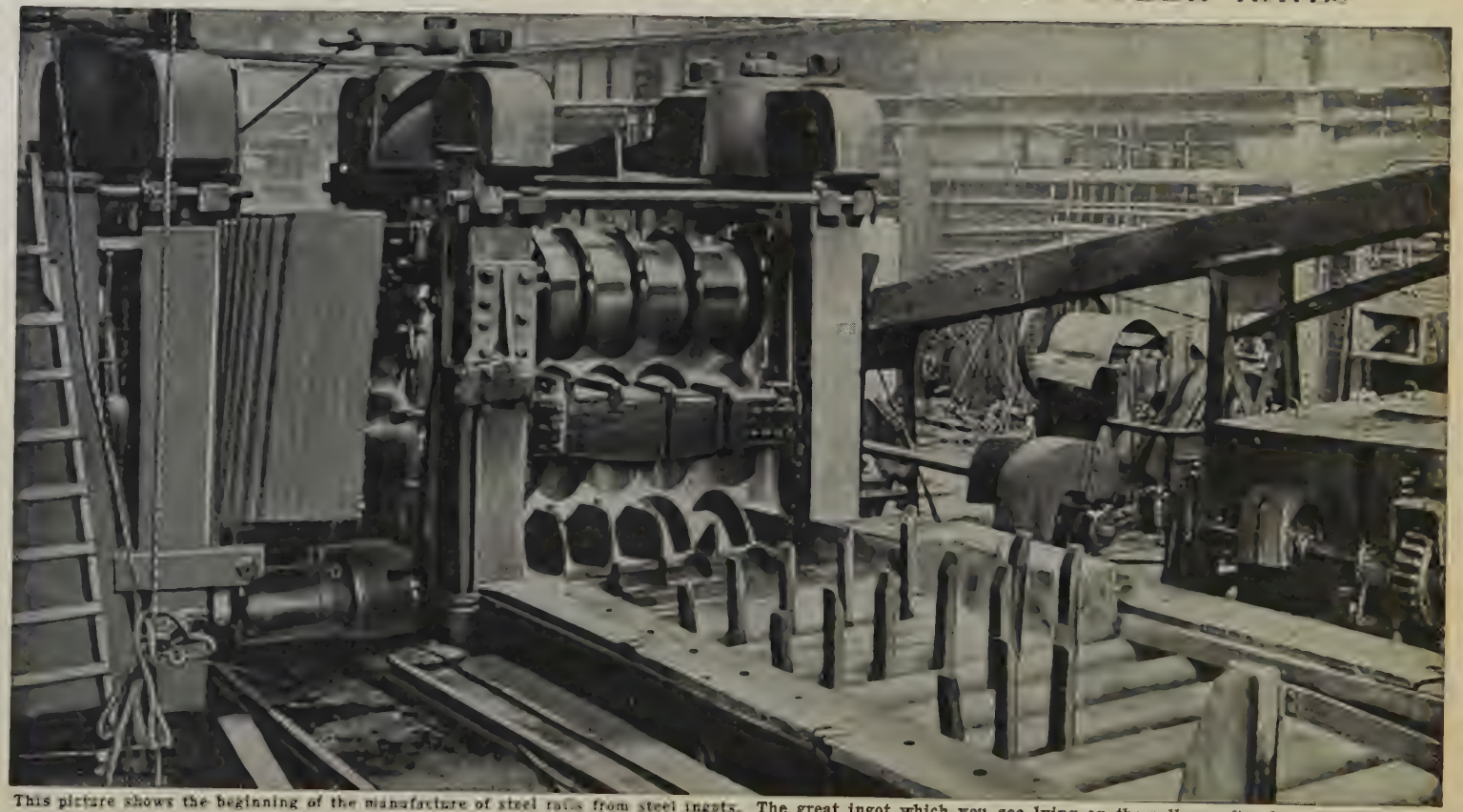
POURING MOLTEN STEEL INTO MOLDS

Whether steel has been made by the Bessemer or the open-hearth process, it is generally emptied into a great ladle with a nozzle in the bottom. Through this nozzle the molds are filled and then allowed to cool for a time. The row of molds you see in the picture are set on trucks which can be moved from place to place. The hardened steel is called an ingot.

REMOVING THE MOLDS FROM THE COOLING INGOTS

When the ingots have cooled, but before they have become cold, they begin to contract and it is not very difficult to remove the molds. This process is called "stripping a heat." If one of the ingots sticks it is pushed out of the mold by a hydraulic press. On the right you can see the presses pushing the ingots from the molds. On the left is a line of empty trucks from which the ingots and the molds have been removed. In the centre are the shining steel ingots which will soon be taken to the rolling mill to be converted into useful forms.

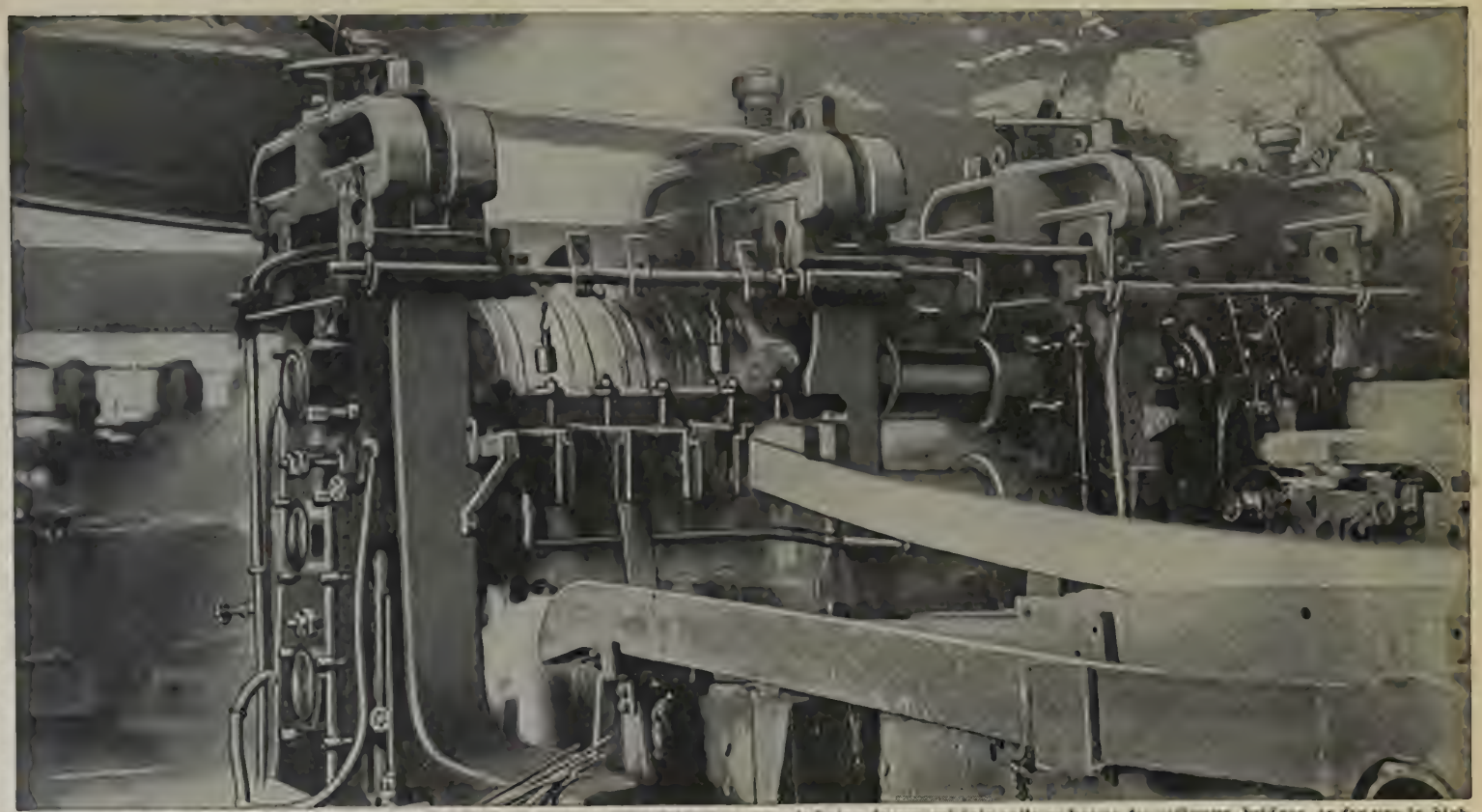
THE FIRST STEP IN THE MANUFACTURE OF STEEL RAILS



This picture shows the beginning of the manufacture of steel rails from steel ingots. The great ingot which you see lying on the rollers, after being heated to exactly the right temperature, is forced between the first set of powerful rollers, which begin to reduce the size and increase the length. It comes out in the form of a beam, which then goes through another set of rollers. There are many rolling machines in the great mills which turn out so much of the steel that is used. These quiet, smoothly running rolls have a power which it is almost impossible to realize.

Picture, courtesy of the Illinois Steel Company.

THE HEAVY INGOT HAS BECOME A BEAM OF STEEL



The beam which has gone through the first set of rolls shown on the preceding page now is being drawn out into rails or beams for railways, bridges, or for use in high buildings which have a steel skeleton. The intensely hot steel in the grasp of these machines is pressed and drawn as if it were so much butter. The power of these rolls is so great that they can crush anything which comes between them. This is one of the most wonderful sights in a steel mill, though some prefer to look at the great blast furnaces already shown.

Picture, courtesy of the Illinois Steel Company.

THE BEAM IS BECOMING A RAIL

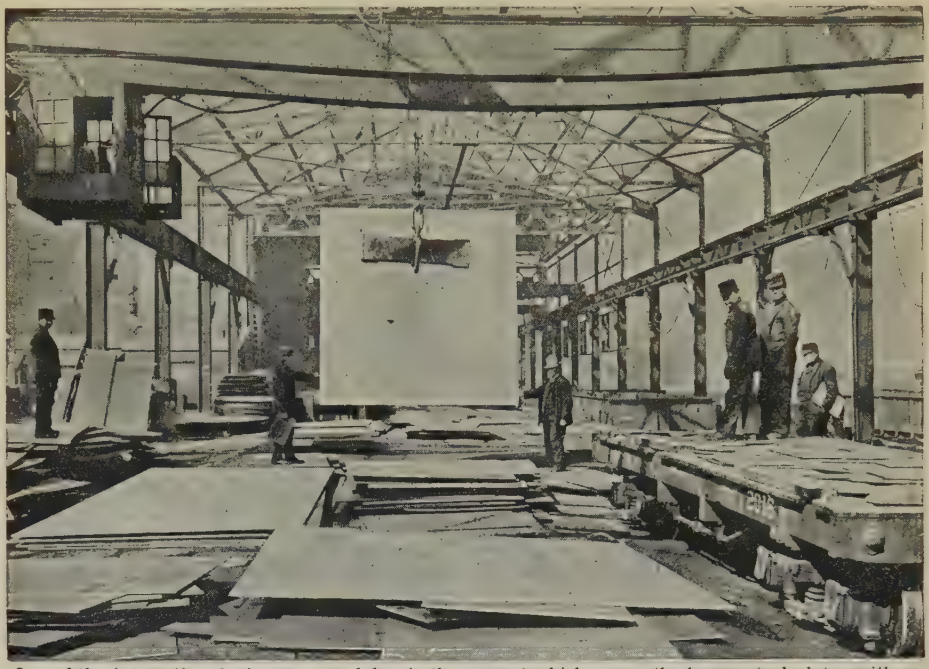
Here we see a great room full of machines similar to that we saw on the preceding page. The process, which we saw begun, has been continued, and the rail is beginning to take its final form. The machine does most of the work, and only the guiding brains of a few men are necessary in the large room. It has been only a little while since the labor of many men could not do at all what you see here being done easily and quickly by the mighty power of machines. Steel rails may be rolled in many different shapes, as you can see if you look at a high building as it is going up.

Picture courtesy of the Illinois Steel Company.

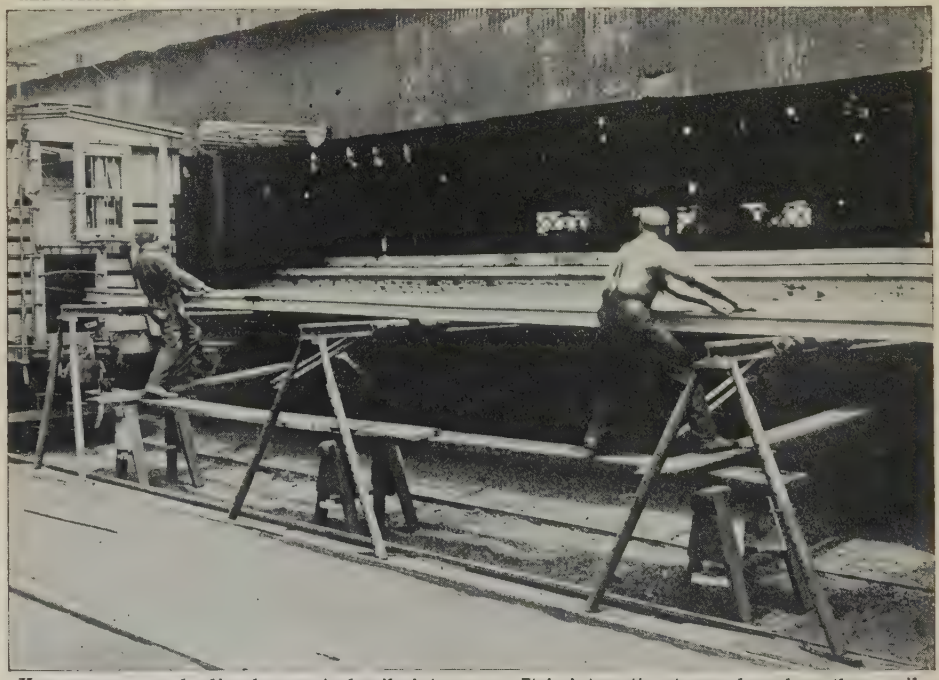
THE INTERIOR OF A GREAT STEEL MILL AT REST

This is the interior of a great rail mill when no work of any sort is going on. It seems strangely different from the preceding pictures, where we saw the whole mill filled with the blinding light of the white-hot metal as the great rails and beams went from one set of powerful rolls to another, each set of which left them a little more like the finished product. No manufacturing of any sort is more interesting to see than a great steel mill. Picture, courtesy of the Illinois Steel Company.

THE FINISHED PRODUCT



One of the interesting devices to save labor is the magnet which moves the heavy steel plates with so much ease. The magnet lifts the plate, and then carries it to a point immediately above the car. The current is then cut off and the plate drops. Without the magnet, handling the plates would be difficult and tedious.



Here we see men loading heavy steel rails into a car. It is interesting to wonder where these rails will finally be used. Perhaps they will be used on a railway on which you may some day travel. Perhaps they will go to South America or to China. Steel rails are used everywhere, and on busy roads they soon wear out in spite of their weight and hardness.

Toronto from Lake Ontario.

THE GREAT LAKES AND THE ST. LAWRENCE

CONTINUED FROM 1840

HISTORIANS tell us that rivers have a great influence on the destiny of nations. A writer of geographies has lately called the St. Lawrence "a roadway into the heart of the continent." Before we set out on our journey down the pathway made by this noble river, let us stop for a moment and think of the influence that it has had on the history of Canada.

Up this great and shining roadway came Cartier on his voyage of exploration. Champlain followed it. The farms and villages of the early settlers were built along its banks. La Salle made his way along it on his way to find the Mississippi, and it was the road by which the adventurers who followed after him traveled when they sought to bar the valley of the Mississippi from the English colonies in the East. If it had not been for this great highway, the history of this whole continent might have told a different tale.

HOW THE GREAT LAKES WERE MADE

Once on a time, you know, there was no river and there were no Great Lakes. All the northern part of the continent was covered with ice which filled the valley. Now if you look at your map you will see that the centre of the whole continent is a great plain. But as you trace the courses of the rivers you will find that the southern portion of the plain is tipped toward the south. In the centre there is a low height of land. The rivers to the north of this flow toward the north and east, while those on its southern side flow southward. If it were not for this height of land, it is probable that the water from most of the lakes would flow to the Mississippi and the St. Lawrence would not exist. It is strange to think that a little height of land, which was perhaps pushed up by a glacier far back in the ages, could alter the history of the world.

In the Glacial Period—the time of cold—all the northern region was covered with ice, which, as it moved onward, scraped the sides of mountains bare, ground out basins, deepened valleys, and in other places raised the surface of vast tracts by overlaying the land with the drift of earth and rocks it carried. Ages passed, and the air became warm again. The ice melted, and in its place a great expanse of water remained. But the water found outlets, as water will. Gradually the higher

land was drained, but the deep basins held their water, and this was the origin of the chain of Great Lakes and the river St. Lawrence, which flows through them and carries their overflowing waters to the sea. We call them lakes, but they are really inland seas, and hold within their deep basins half the fresh water there is in the world.

WHERE THE ST. LAWRENCE REALLY BEGINS

We usually think of the St. Lawrence as rising in Lake Ontario. Really it rises in Lake Nipigon, north of Lake Superior, and flows down through all the lakes, though we call it by different names. The lakes are like the fountains, made in steps, that you sometimes see. The water overflows from one into the other, but the stream is continuous. The St. Lawrence with its tributaries drains over four hundred thousand square miles of territory, most of it in Canada.

On this trip, our starting-place is at Fort William, at the head of Lake Superior, where we have come to meet a beautiful steam yacht that is to take us down through the Canadian waters of the lakes. Fort William was a headquarters of the Hudson's Bay Company, and every year the officials held high festival there. But the days of the fur company are gone. Wheat is king in Fort William, and huge elevators mark its power. The golden grain is gathered in these elevators from the prairie lands, and much of it is shipped by boats which go down the waterways to Montreal.

We shall not see the wild and rocky northern shore of Lake Superior. We pass out of the harbor, pass Thunder Cape and Isle Royale, and keep almost a straight course across the lake. At White Fish Bay we pass the lighthouse and find the entrance to the Sault Ste. Marie, where the overflowing ice-cold waters from Lake Superior plunge themselves down the rapids to reach the lower level of Lake Huron. The rapids are so dangerous that canals, with long, still stretches of water, have been built to make a passage for the ships; but while our boat makes her slow way through the lock, we hire an Indian guide and his canoe and shoot the rapids, as the Indians, the early French, the *coureurs de bois,* and many a hunter and trapper in long procession have done before us.

THE BEAUTIFUL REGION OF GEORGIAN BAY

After we have passed the canal at Sault Ste. Marie, which we remember means "Falls of St. Mary," we sail down the St. Mary's River, as our river is here called, into Lake Huron. We should like to pass down below the island of Mackinac into Lake Michigan, which is here surrounded by the state of Michigan. We want to see Green Bay, where La Salle landed, and the great city of Chicago, which has grown up on the site of Fort Dearborn, but our host tells us we must leave that for another time.

Our captain turns the bow of our staunch little boat across Lake Huron, past Pelee Island, famous for its grapes, between Manitoulin and the mainland into Georgian Bay, one of the most beautiful stretches of water that the world holds. Islands meet the eye on every side; some of them are rocks, some of them little islands with a tree or two, thousands large enough for a summer cottage or a camping-place.

North of Lake Huron, in the Sudbury district, are the great nickel and copper mines, with their stores of wealth, and on Manitoulin Island there are copper mines, but our minds are filled with the beauty of the scene and we have little thought left to-day for natural resources. We take our leisurely way through the islands and stop at the little town of Collingwood, where great freight ships are built. We stop at Owen Sound, then sail out again into Lake Huron, through the St. Clair River and Lake, and the Detroit River into Lake Erie. Now we sail along the southern shore of the peninsula to Port Colborne, where we enter the Welland Canal and enjoy the novel experience of steaming down its placid waters through fields and country villages to Lake Ontario. Once we have reached the lake we leave our yacht and take the train for a visit to Niagara Falls, those famous falls that the Iroquois called the "Thundering Water."

WHERE THE "THUNDERING WATER" COMES FROM

Let us think for a moment what this thundering water carries. Back of it are four of the Great Lakes—Erie, Huron, Michigan and Superior. When the overflow from all these lakes enters the Niagara River, it flows quietly between

Where the great river throws itself over the Niagara Falls the sight is superb and can be viewed to best advantage from the lower level at a little distance. Beneath the sun's rays, by the light of the moon, or in midwinter when the great ice-bridge forms below, the falls are majestic.

Photo, Royal Canadian Air Force.

Upon its outlet from Lake Ontario the channels of the St. Lawrence wind among the famous Thousand Isles. The little island to the right of the photograph is just opposite Alexandria Bay. To the right the white streak shows the strong current of the river.

its wide banks until it reaches the rapids a little way above the Falls. At the head of the rapids the waters begin to hurry, hurry, hurry, as if in haste to make the adventurous leap beyond, and when they reach the brink of the chasm, down which they must roll to the lake, they leap forward into the abyss a hundred and sixty feet below. We cannot tell what impresses us most, the hurrying water at the rapids, which we could watch for hours, or the sublime spectacle of the great mass of water as it leaps into the chasm below. Immediately below the falls is a quiet stretch of water, where the ice bridge forms in winter. Then the water rushes down a steep incline between narrow banks, to the whirlpool, where it strikes against a jutting point of land and is sent back in a sweeping current to swirl round and round before it escapes. We follow down its steep banks, fascinated by the swirling waters that rush by far below our feet until at last they reach a gentle slope, and flow quietly down to meet the blue waters of Lake Ontario. The great water power from the Falls is used to work factories and run railways from Buffalo to Toronto.

KINGSTON, THE WEST POINT OF CANADA

At Niagara-on-the-Lake, which we remember was once called Newark, and was the first capital of Upper Canada, our yacht meets us, and we sail across the lake to Toronto. Passing by Burlington Beach, we keep within sight of the land, for there are many pleasant places along this shore. We make no stay at Toronto, for our vacation time is drawing to a close and we have much to see, so we go on our way straight across the lake until we reach the city of Kingston.

The city is beautifully situated where the St. Lawrence flows from Lake Ontario. Most of the buildings are of gray limestone, and so it is called the "Limestone City." It is a quaint, attractive place, full of historic interest, for it was built on the site of Frontenac's fort, and was once the seat of the government of Canada. The Military College, Canada's West Point, is here, and Queen's University, which ranks with Toronto University and McGill. The massive graystone forts, the quaint Martello towers and the imposing public buildings all make the city full of interest.

Opposite the city the St. Lawrence leaves Lake Ontario. Seldom less than two miles in width, it is two and one-half miles wide where it issues from Lake Ontario, and with several expansions which are called lakes it becomes eighty miles in width where it ceases to be called a river. The influence of the tide is felt over five hundred miles from the gulf, while it is navigable for seagoing vessels to Montreal, eighty miles farther inland. Rapids prevent navigation above this point, but by means of canals, boats pass from Montreal to Lake Superior.

If inferior in breadth to the mighty Amazon, if lacking the length of the Mississippi, if missing the ancient castles of the Rhine, if wanting the lonely grandeur that overhangs the Congo, the majestic St. Lawrence has features as remarkable as any of these. It has its source in the largest body of fresh water upon the globe, and among all of the large rivers of the world it is the only one whose volume is not sensibly affected by the elements. Its level of late years has been altered when its waters have been drawn off for canals or for water power.

THE THOUSAND ISLANDS

Where the great Laurentian chain of mountains, running from east to west across Canada, swings southward to enter New York, it drops a link, as it were, and allows the last of the big lakes an outlet into the channel of the St. Lawrence, which moves sluggishly among the numerous islands, helping to form the most picturesque archipelago in the world. The actual number of islands in this Lake of the Thousand Isles is near two thousand, varying in size, shape and appearance from a small barren rock projecting from the surface of the river, to larger ones ornamented by summer residences varying in style of architecture from the modest cottage of the camper to the magnificent castle of the millionaire; and finally islands of large area covered with many farms.

Leaving Kingston, we wind in and out among these charming islands to the American town of Clayton, noted as a summer resort. Below this thriving town, island after island studding the quiet waters rises into view, the finger-tips of the great mountain range. On one of these larger isles is located

ONE OF CANADA'S RIVERS

One of the most beautiful rivers of Canada is the Kaministiquia. We show you here its more restless appearance as it dashes over stones and apparently struggles to be free. Notice the different strata in the rocky banks through which the river has cut its way. The Falls of Kakabeka are on this river.

Here is the same river, though you can hardly believe it. This quiet and placid stream with the grain elevators along its banks and the steamers on its waters seems entirely different from the restless stream above. The town is Fort William, Ontario, which is a centre of the grain trade.

Photos, copyright by H. C. White Co.

the "Thousand Island Park," while a little below is the fashionable resort known as the "Saratoga of the St. Lawrence," Alexandria Bay.

From Clayton to Chippewa Bay the river with its clustered isles is like a fairyland. Hundreds of islands lie across the course of the steamer, all differing in size, coast and coloring, and forming an intricacy of channels amid which only an experienced pilot can guide a boat. Now we are entering a narrow pass between cliff-like banks covered with moss and trailing creepers, then we open into a lake-like expansion, then again among winding courses, through clustering islands and round rocky points. Everywhere art has combined with nature to enliven the scene. Islands are dotted with cottages in all sorts of picturesque surroundings, some perched on rocky bluffs showing among the trees, others snugly resting on low-lying islands or nestling in beautiful coves along the mainland. During the summer season the grand illumination of the islands takes place on Wednesday and Saturday evenings, when the entire region is transformed into a fairyland which must be seen to be appreciated.

The last of the Thousand Islands are called "The Three Sisters." Scarcely have we emerged from the still lingering images of the beautiful island scenery when the spires and roofs of the Canadian town of Brockville come in view. This town, named after General Brock, is built on an elevation which ascends by successive ridges from the St. Lawrence. A few miles below, Ogdensburg on the American side and Prescott on the other, stand like sentinels long on duty.

THE RAPIDS OF THE ST. LAWRENCE

At Prescott we leave the yacht, which we send down through the canals, and change to a river steamer with large observation decks. Soon after the last glimpse of Prescott fades in the distance we enter the Galops, the first of the series of rapids marking the downward flight of the waters. These are only a foretaste of what is to follow. We rapidly pass the picturesque Canadian towns of Cardinal and Iroquois. A little distance below Iroquois the Rapids du Platt swirl their dark green waters among a group of wooded islands. After shooting the du Platt, the steamer glides with increasing motion past a picturesque point named Woodlands, and in and among bolder shores on the north side of Croyles Island into sight of the turbulent waters of the Long Sault with its snow-crested billows of raging waters. This, the greatest of the really remarkable rapids of the St. Lawrence, extends about nine miles down stream to Cornwall and is divided into channels by numerous beautifully wooded islands.

The "shooting of the rapids," as the descent by boat is called, is a most exciting experience. Navigation of the Long Sault requires exceptional nerve and precision in piloting, as well as extra power to control the helm; hence the rudder is provided with a tiller besides the regular apparatus, while four men are kept at the wheel to insure safe steering, and as a result of such precautions accidents are unknown.

The St. Lawrence expands below Cornwall, forming the beautiful Lake St. Francis, twenty-eight miles in length. Below the lake we enter the Coteau Rapids. These rapids, about two miles long, are very beautiful and have a very swift current. About seven miles farther down we sweep past a small island where the trees almost dip into the hurrying stream, and rounding a sharp curve, we enter the Cedar Rapids. On the left is a beautifully wooded island and on the right is Hell's Hole, the greatest commotion in the river from Kingston to the gulf. These rapids are very turbulent, and the passage is very exciting. Scarcely has the boat left the Cedar Rapids before she enters the Split Rock Rapids, with many submerged boulders guarding the entry. One cannot restrain a shudder as the ship approaches these threatening rocks, but the skillful hand of the helmsman turns the boat aside and it passes by unharmed.

A short distance below are the Cascades, the last of this series of rapids, made conspicuous by white-crested waves which mount tumultuously from the dark green waters in a choppy, angry way. This group of four rapids following one another in close succession extends in length about twelve miles.

Below the Cascades the river expands into Lake St. Louis. Its shores are among the beauty spots of the St. Lawrence. After issuing from the lake we pass the town of Lachine, nine miles

SUMMER AND WINTER ON THE LAKES

This picture shows a freight boat coming down the St. Mary's River from Lake Superior to Lake Huron on a calm summer evening. The river is very wide and is divided by islands, one of which you can see in the picture. It is the boundary line between the United States and Canada, and some of the islands belong to the one country and some to the other. The scenery of the river is very beautiful.

This boat has just come down the same way as the boat shown above. Dreadful storms rage on the Great Lakes in the winter season, and after about the middle of November navigation is not safe. The brave men on this boat have just brought her down from Lake Superior in December, but you can tell from her icy coating what a struggle they have had. Many boats have been lost in storms on these lakes.

from Montreal. Just below the town the steamer glides into midstream, that moves with increasing speed, indicative of the coming rapids, which now appear in full view. And soon we enter the last of the St. Lawrence rapids, the Lachine. A moment more and we have completed the descent, and ride in tranquillity on the quiet waters below. Passing the beautifully wooded shores of Nun's Island, we see the famous Victoria Jubilee Bridge.

Sweeping beneath the great bridge, we come in full view of the city of Montreal, with its busy harbor, beautiful buildings of massive stone, stately churches and cathedrals, noted colleges, famous parks, and, most of all, its royal "mount," lifting its imperial head 740 feet above the din and noise of the street.

THE ST. LAWRENCE BETWEEN MONTREAL AND QUEBEC

Leaving Victoria Pier, we first pass Longueuil, a village on the south bank. The first town of note is Sorel, at the mouth of the Richelieu River and forty-five miles from Montreal. It stands on the site of the fort built by De Tracy in 1665, and was for many years the summer residence of the governors of Canada. About five miles farther down, the river expands into a sheet of water twenty-five miles long and nine miles broad, known as Lake St. Peter.

Passing the mouth of the St. Francis River, we arrive at the city of Three Rivers, midway between Montreal and Quebec. Continuing the journey, we pass St. Anne and the Jacques Cartier River, after which the land on the river banks begins to rise, presenting a bold and picturesque appearance as we near Quebec, the only walled town in North America. The mouth of the Chaudière on the south next attracts our attention, and next the great cantilever bridge, of which you see a picture on page 39. As our little boat passes beneath the bridge we wonder at its size, and marvel that men could be found great enough to think of such a structure, and patient enough to labor in its building.

Before us is the grand gateway of the St. Lawrence, and on our left, crowning Cape Diamond, is the famous citadel of Quebec. This lofty fortress, which covers an inclosed area of forty acres, 365 feet above the river, was built from plans approved by the Duke of Wellington. Since the withdrawal of British troops in 1871 it has been garrisoned by Canadian soldiers. The old walls of the Upper Town still stand, but the city has spread far beyond them.

THE GRANDEUR OF THE SCENERY ON THE LOWER ST. LAWRENCE

Leaving Quebec, we pass the Isle of Orleans on the left, and near its eastern end Mount St. Anne raises its head 2,700 feet above the river, and a short distance below the end of the island Mount Tourmente, nearly 2,000 feet in height, with its lonely lighthouse, looms against the sky. We pass Capes Burnt and Rouge, and a short distance farther on is Cape Grebaune, which towers 2,200 feet above the steamer. A few miles eastward is Murray Bay, the favorite watering-place on the Lower St. Lawrence. The river here is fifteen miles broad, and its waters are as salt as the ocean itself. Murray Bay, with the grand old Laurentian Mountains behind and the river in front, furnishes a variety of scenery not often found in combination.

Some miles below Murray Bay the Pilgrims are seen. They consist of a remarkable group of rocks which are visible at a great distance; "the mirage" seems to dwell about them. We now reach Tadoussac, at the mouth of the Saguenay River. This town was the first settlement made by the French on the St. Lawrence and was their principal fur-trading post.

From this point the northern shore is rough and broken, while along the southern there is an almost continuous chain of fishermen's hamlets, farmhouses, villages, marked by windmills, forests and green meadows, with here and there a silvery stream winding sluggishly down to the river. The St. Lawrence grows wider and wider, until it has a width of eighty miles, when it is lost in the gulf of the same name.

No other river can boast of such a chain of inland seas along its course, or has such a wealth of picturesque islands. Its banks have seen the conflict of races for the mastery and the struggle of nations for the possession of a continent. We may well say that in its majestic course from lake to the broad ocean the St. Lawrence offers to the traveler more of beauty, history and romance than any other river in the world.

HOW A SHIP GOES DOWN A HILL

This picture gives an idea of the freight that passes through the St. Mary's River. If the picture were large enough you could see another large boat in the distance. They hold a beautiful line as they steam through the channel, one following the other at a safe distance. This is the Michigan Channel of the river, as you may see from the coast-guard station on the right. The men on duty report each boat that passes.

This is the little Grenville Canal on the Montreal, Ottawa and Kingston route. It is on the Ottawa River and avoids the Long Sault Rapids. It is about 56 miles below the city of Ottawa, up to which point the river affords unimpeded navigation. Though only about 5¾ miles in length, it has five locks in its course, which overcome a total rise of 43¾ feet. It varies from 50 to 80 feet in width.

THE WITCH OF THE GINGERBREAD HOUSE

When Hansel and Grethel were lost in the forest they came upon a wonderful house made of gingerbread, with a roof of cake and windows of barley sugar. They were so hungry that they broke off a piece of barley sugar and began to eat it. Suddenly an old woman appeared and invited them in.

HANSEL AND GRETHEL

CONTINUED FROM 1849

ONCE upon a time, near the borders of a dense forest, there dwelt a poor man who earned his living by cutting wood.

One day, on his way home through the wood, he found a poor little girl who had been carried away by a vulture, and left high up on the branch of a tree to die. He took the little girl home to his wife, and they called her Grethel, and brought her up with their only son, Hansel. But the wife died, and the wood-cutter married again. After a little while he became very poor indeed, and could hardly earn enough money to buy bread.

One night as they were lying awake, weak and restless from hunger, Hansel and Grethel heard their stepmother say to their father:

"In a few days we shall all die of hunger. If we had only ourselves to keep we might manage to live. I know what we must do. Early to-morrow morning we will take the children far into the forest and leave them there."

"No, wife," said the man. "How can I have the heart to leave my children all alone in the forest for the wild beasts to kill and devour?"

But the hard-hearted woman talked and talked until the poor man agreed to what she proposed.

Hearing this dreadful plan, Grethel wept bitterly. But Hansel, who deeply loved her, comforted her.

"Do not cry, dear Grethel," he said; "I will find a way to get home safely."

He then got up quietly, crept out of the house, and filled his pockets with little white pebbles.

At sunrise their stepmother wakened Hansel and Grethel, saying: "Get up, children! We are going into the forest to gather wood"; and she gave them two slices of bread for their dinner. Grethel carried both pieces in her apron, as Hansel's pockets were full of pebbles.

As they went along, Hansel kept looking back, until at last his stepmother asked him sharply why he kept lingering and looking behind.

"I can see my little white cat sitting on the roof, and I am sure she is crying for me," said Hansel.

"You stupid!" she replied. "It is only the sun shining on the chimney-pot."

When they reached the middle of the wood their stepmother said:

"Run about and collect twigs, and we will make a bonfire to keep warm."

And Hansel and Grethel soon had a blazing bonfire of brushwood. Tired with their long walk, they fell asleep; but when they woke up it was dark, and they were quite alone. Grethel began to cry bitterly; but Hansel said:

"We shall be able to find our way home all right when the moon rises, because I dropped a white pebble every time I looked behind this morning."

When they reached home they were scolded by their stepmother for straying away; but their father was ever so pleased to see them come back safely.

Not long afterward, however, the same poverty came upon them, and the stepmother persuaded her husband to take the children much farther into the wood. The children again overheard the cruel scheme; but Hansel was unable to get a pocketful of stones because his mother had locked the door. He bravely lingered behind, however, and dropped crumbs from his piece of bread all the way along.

"Why do you lag behind so, Hansel?" said the woman.

"I am looking at my little dove sitting on the roof to say good-bye to me," replied Hansel.

"You silly boy!" said she. "It is only the morning sun shining on the housetop."

Their mother left them when they were asleep just as before, and when Grethel said: "What are we to do, Hansel, dear, for the night is coming on and we are much farther in the forest than we were last?" Hansel replied: "Do not fear, dear Grethel; I have left all my bread in little crumbs on the wayside."

So Grethel dried her eyes and shared her piece of bread with Hansel. When the moon rose they started off; but, to their alarm, they found that there were no crumbs to be seen, as the birds had eaten them all up. They wandered about the forest all through the night and the next day, finding only berries to eat; but they could not find their way home, so they laid themselves down and went to sleep.

About noon the next day they saw a lovely snow-white bird sitting on a branch, and singing so beautifully that they listened to it for a long while. When it had finished singing it flew slowly away, looking round at the children as if inviting them to follow. This Hansel and Grethel did, and after a little while the bird perched on the roof of a tiny house.

To their surprise they found that the walls of this little house were made of gingerbread, the roof of cake and the windows of barley-sugar.

"Oh! Something to eat at last!" cried the hungry Hansel. "Here is a lovely piece of barley-sugar for you, Grethel." And the two children pulled pieces of gingerbread off the walls, and ate to their heart's content. Suddenly came a voice from within:

"Munching, crunching, munching,
Who is eating up my house?"

And the children answered:

"The wind, the wind,
'Tis only the wind!"

and went on eating hungrily.

In a minute or two the door opened, and a little old woman hobbled out.

"Poor little children," said she. "How tired and hungry you look! Come in with me, and I will give you plenty to eat and drink."

The children followed her in, and had a meal of milk and pancakes, and apples and nuts. And then she put them into two pretty little beds, and they fell asleep and dreamed they were in heaven.

Now, the old woman was really a bad fairy, who had built this gingerbread house to attract children, so that she could capture them and eat them. So when Hansel was asleep she took hold of him and quickly shut him up in an iron cage. Then she shook Grethel, and said:

"Get up, lazy-bones, and help me get water and cook some food, for I am going to fatten your brother and eat him."

After breakfast the old woman went out. Grethel immediately ran and told Hansel all the old woman had said.

"The old woman must be a bad fairy," said Hansel. "Search for her magic wand and pipe, and then help me out of this cage."

So Grethel found the wand and pipe, and they ran away together. After some time the old fairy came back, and was very angry to find that Hansel and Grethel had escaped her. So she put on her seven-leagued boots, and quickly caught up with the children.

As soon as she saw the bad fairy, however, Grethel waving the magic wand, changed herself into a lake, and Hansel into a swan floating on it.

The fairy tried hard to entice the swan to the shore by offering him crumbs of bread and cake, but he would not move, so she gave it up and went home in disgust for the night. Grethel then changed Hansel and herself back into their proper forms, and on they went. Next day they

perceived the fairy overtaking them again. This time Grethel changed herself into a rose in a prickly hedge, and Hansel sat on a mossy bank beside it and waited.

The fairy soon came up and mounted the bank to pick the rose which she knew must be Grethel. Hansel quickly put the pipe to his mouth and began to play. Now, as it was a fairy pipe, everyone who heard its music had to dance, even the old fairy, and there she capered and jigged, till she was fixed firmly into the hedge, where the sharp thorns tore her clothes off and pricked her skin.

Grethel freed herself once more, and they went on again, but became very weary, so Grethel decided to turn herself into a daisy, while Hansel should try to find the way home alone. But Hansel got lost and did not return.

One day a shepherd spied the daisy, and picked it, saying: "I will take this little flower home with me; it is the prettiest daisy I have ever seen."

So he took it home and placed it in a box, and from that day everything flourished wonderfully in his house. All the work was done, the fire made and the water fetched, before he got up. He could not make this out, so he went to a wise woman, and she said:

"It must be witchcraft. Get up early to-morrow morning and throw a white cloth over anything that moves."

So he got up early and saw the box open and the daisy come out. He at once threw a white cloth over it, and the beautiful Grethel stood before him. She told him her troubles, and said:

"I will stay with you until Hansel comes back."

A long while passed and at last Hansel came back. The children once more started for home, but getting tired, they went to sleep in an old hollow tree.

In the morning when they awakened, the sun had risen high above the trees, and it was very hot. Little Hansel said:

"Sister, I am very thirsty; if I could find a brook I would go and drink, and fetch you some water too. Listen! I think I hear the sound of one."

Then Hansel rose up and took Grethel by the hand and went in search of the brook. But the fairy had found out all that had happened, and was ready to do them harm. When they had found a brook that ran sparkling over the pebbles, Hansel wanted to drink, but Grethel thought she heard the brook, as it babbled along, say: "Whoever drinks here will be turned into a tiger." Then she cried out:

"Ah, brother, do not drink, or you will be turned into a wild beast and tear me to pieces."

"I will wait," said Hansel, "for the next brook."

But when they came to the next, Grethel listened again, and thought she heard: "Whoever drinks here will become a wolf." Then she cried:

"Brother, brother, do not drink, or you will become a wolf and eat me!"

So he did not drink, but said:

"I shall wait for the next brook; there I must drink, say what you will, for I am so thirsty."

As they came to the third brook, Grethel listened, and heard: "Whoever drinks here will become a fawn."

"Ah, brother," said she, "do not drink, or you will be turned into a fawn and run away from me!"

But Hansel had already stooped down upon his knees, and the moment he put his lips into the water he was turned into a fawn.

Grethel wept bitterly over the poor creature, and the tears, too, rolled down his eyes as he laid himself beside her. Then she said:

"Rest in peace, dear fawn; I will never leave you."

So she took off her golden necklace, and put it round his neck, and plucked some rushes and plaited them into a soft string to fasten it, and led the poor little thing by her side farther into the wood.

After they had traveled a long way they came at last to a little cottage; and Grethel, having looked in and seen that it was quite empty, thought to herself, "We can live here." Then she went and gathered leaves and moss to make a soft bed for the fawn, and every morning she went out and plucked nuts, roots and berries for herself, and sweet shrubs and tender grass for her companion; and it ate out of her hand, and was pleased, and played and frisked about her. In the evening, when Grethel was tired and had said her prayers, she laid her head upon the fawn for a pillow, and slept. They lived thus a long while in the wood by themselves, till it chanced that the king of that country came to hold a great hunt there. And when the fawn heard all around the echoing of the horns, and the

baying of the dogs, and the merry shouts of the huntsmen, he wished very much to go to see what was going on.

"Ah, sister," said he, "let me go out into the wood. I can stay no longer!"

And he begged so hard that at last she agreed to let him go.

"But," said she, "be sure to come to me in the evening. I shall bar the door to keep out those wild huntsmen; and if you tap at it, and say: 'Sister, let me in,' I shall know you; but if you don't speak, I shall keep the door fast."

Then away sprang the fawn and frisked and bounded along in the open air. The king and his huntsmen saw the beautiful creature, and followed, but could not overtake him; for when they thought they were sure of their prize, he sprang over the bushes and was out of sight in a moment.

They went to sleep in an old hollow tree.

As it grew dark he came running home to the hut, and tapped, and said: "Sister, sister, let me in." Then she opened the little door, and in he jumped, and slept soundly all night on his soft bed of moss.

Next morning the hunt began again; and when he heard the huntsmen's horns, he said:

"Sister, open the door for me, I must go again."

Then she let him out, and said:

"Come back in the evening, and remember what you are to say."

When the king and the huntsmen saw the fawn with the golden collar again, they gave him chase; but he was too quick for them.

The chase lasted the whole day; but at last the huntsmen nearly caught up with him, and one of them wounded him in the foot, so that he could hardly crawl home. The man who had wounded him followed close behind, and hid himself, so that he heard the little fawn say: "Sister, sister, let me in." Then the door opened, and shut again. The huntsman marked all well, and went to the king and told him what he had seen and heard. The king replied:

"To-morrow we shall have another chase."

Grethel was very much frightened when she saw that her dear little fawn was wounded; but she washed the blood away and put some healing herbs on it, and said:

"Now go to bed, dear fawn, and you will soon be well again."

The wound was so small that in the morning there was nothing to be seen of it, and when the horn blew, the little creature said:

"I can't stay here; I must go to look on. I will take care that none of them shall catch me."

But Grethel said: "I am sure they will kill you this time; I will not let you go."

"I shall die," answered he, "if you keep me here. When I hear the horns, I feel as if I could fly."

Then Grethel was forced to let him go; so she opened the door with a heavy heart, and he bounded out gaily into the wood.

When the king saw him, he said to his huntsmen:

"Now chase him all day long till you catch him; but let none of you do him any harm."

The sun set, however, without their being able to overtake him, and the king called away the huntsmen, and said to the one who had watched the fawn:

"Now come and show me the hut."

So they tapped on the door, and said: "Sister, sister, let me in."

Then the door opened, and the king went in, and there stood a maiden more lovely than any he had ever seen. Grethel was frightened to see that it was not her fawn but a king with a golden crown. However, he spoke kindly:

"Will you come with me to my castle and be my wife?"

"Yes," said the maiden. "But if I come my fawn must go with me."

"Well," said the king, "he shall come and live with you, and want for nothing."

Just at that moment in sprang the fawn, and his sister tied the string to his neck.

Then the king took Grethel to his palace, and celebrated the marriage in great state. And she told the king all her story; and he sent for the fairy and punished her. And the fawn was changed into Hansel again, and he and his sister loved one another, and lived happily together all their days.

THE FABLES OF ÆSOP THE SLAVE

THE VILLAGER AND THE VIPER

ONE cold winter day a villager found a viper under a hedge almost dead with cold. The man had pity on the poor creature, brought it home and placed it on the rug before the fire. After it had been there some time the warmth revived it, and it at once began to hiss and to threaten to bite the children.

The villager heard his children cry, and running in he caught up a stick and killed the viper, saying: "Is this the way you reward those who try to save your life?"

People who are not grateful for kindnesses are unlikely to receive any more.

THE FOX AND THE GOAT

A FOX one day happened to fall into a well, and could not get out. Some hours afterward a goat came to the place, and, wanting to drink, asked the fox if the water was good.

"It is so very good and sweet," said the fox, "I have drunk so much that I am afraid I shall be ill."

Thereupon the goat, without any more hesitation, jumped into the well to drink the water. The fox at once sprang on her back, and so was able to leap out, leaving the poor goat in the well to get out as she could.

Be careful how you take the advice of people whom you do not know.

THE BOY WHO CRIED "WOLF!"

THERE was once a shepherd boy who watched a flock of sheep in the fields. As a joke he would shout "Wolf! Wolf!" This caused the men working in neighboring fields to run to the rescue, but after being deceived two or three times, they decided to take no notice of his shouts.

Afterward a wolf really came, and the shepherd boy cried out in earnest. But no one took notice of his shouts, and his sheep were killed by the wolf.

If we tell untruths, no one will believe us when we speak the truth.

JUPITER AND THE ASS

AN ass which belonged to a gardener, and was tired of carrying a load of cabbages to market every day, prayed to the god Jupiter to give him a new master. Jupiter consented, and gave him a tile-maker, who sent him every day to market with a heavy load of tiles.

The poor donkey found that his work was harder than ever, so he again asked the god to give him a change. This time Jupiter gave him to a tanner, who treated him more hardly and cruelly than either of his former masters.

When it was too late the ass wished that he had stayed with his first master.

Be contented with your lot.

THE FOX AND THE LION

THE first time a fox saw a lion and heard his terrible roar he was so frightened that he lay trembling on the ground and almost died with fear.

The next time he met the king of beasts he was not so frightened, but ventured to look timidly at him. The third time that the two animals met, the fox had lost all his fear, and came coolly up to the lion and entered into conversation with him as if he had been an old friend.

Familiarity breeds contempt.

THE TRAVELERS AND THE AX

AS two men were traveling along a road, one of them saw an ax on the ground and cried: "I have found an ax!"

"Do not say *I*," returned the other, "but rather *we* have found an ax; for as we are companions, we ought to share it." But the first would not agree to this.

Before they had gone far, the real owner caught up with them and threatened to prosecute. Then the finder of the ax cried out: "Alas, we are undone!"

"Nay," replied the other; "do not say *we*, but *I* am undone. You would not permit me to share the prize, and so I am unwilling to share the danger."

Share and share alike.

LEGENDS OF THE STARS

In the early ages shepherds tending their sheep and goats; huntsmen pursuing the hare, the bear, the wolf and the lion; sailors on the wide sea meeting whales and sea-monsters, or seeking fish, fancied that they could make out pictures in the groups of stars. They invented stories about them and about wonderfully strong and beautiful beings, gods and goddesses, who were more than human, living high up there in the sky. Here are a few of these legends telling of the star-pictures beginning on page 3787.

AN INDIAN LEGEND

ACCORDING to an Indian legend from California, the sun, moon and stars are one big family. The sun is the great chief and ruler of the heavens; the moon is his wife, and the stars are his children, whom he has to eat to keep himself alive when he can catch them. But when he is up in the morning, they flee out of his sight as fast as they can, and dare not appear again until he goes into his hole in the west. He crawls along this hole till he comes to his narrow bed in the middle of the earth. This is so small that it does not give him room to turn round; so when he wakes up next day he has to creep out to the east. Then his wife, the moon, takes her rest.

Every month she grieves when he eats up some of the stars, and puts black over her gentle face to show her sorrow. This gradually wears off, till by the end of the month her face is bright again. The stars are happy with their mother, the moon, and sing and dance as she passes among them. After a time other star-children disappear, and she has to put on mourning again for them.

ORION, THE BELTED GIANT

ORION was a giant who wanted to marry Merope, daughter of Œnopion, king of Chios; but this king, who took a dislike to the suitor because of his great height, thinking to rid himself of a troublesome person, consented to the marriage only on condition that Orion should free the island of Chios from the beasts that raged there. This he did, but King Œnopion failed to keep his promise, and had him blinded. Then Orion was directed by a blacksmith, whom he carried on his back, to the best spot to face the rising sun. Gazing at it, Orion recovered his sight.

According to one legend, Diana, through jealousy, slew him with her arrows; according to another, his death was due to the bite of a scorpion which rose from the ground to punish him for boasting of his prowess as a hunter. He was carried to the heavens, and there shines as a constellation of seventeen stars, girt in a lion's skin with a glittering star belt round his waist and his dog Sirius near him. He is found near the feet of the Bull, and is sometimes shown with a club or a sword in his hand, and bearing a shield. When the constellation rises early, it was regarded by the ancients as a sign of summer; when late, of winter and stormy weather; when it rises about midnight, the season of vintage.

THE GREAT DOG

NEAR Orion, between the Hare and the Milky Way, as far south as we in the Northern Hemisphere can see, lies the Great Dog of Orion, containing one very brilliant star called Sirius. It used to be regarded as a warning by the Egyptians, just as a good watch-dog warns a house of coming danger. The dog in the sky could not bark, but its bright light let the Egyptians know of any harmful event about to happen.

When they saw the star in the early morning they knew the Nile would soon overflow. So one name they gave it was the Nile Star. Of course, they knew nothing of the real sources of the Nile then, because no one had found them out. Sometimes, to show what it was necessary to do on its appearance, they pictured the dog as a man with a dog's head, a stew-pot in his arms, a feather under one arm, wings at his feet, leaving behind him a duck and a tortoise. The Greeks and Romans associated the Dog Star with the heat of summer, and said that it burned up the fields and killed the bees. We still talk of the dog days in the hottest season.

A FAMILY GROUP

THERE are four constellations in the sky standing for quite a family group. Cassiopeia, the mother; Cepheus, the father; Andromeda, the daughter; and Perseus, the son-in-law, with, a little farther off, Pegasus, his winged horse. Cassiopeia foolishly declared her-

self to be more beautiful than the Nereides, and the angry nymphs, in revenge, persuaded Neptune to send a sea-monster to trouble Ethiopia, or Topa, where Cassiopeia lived, for she had married King Cepheus of that country. The story of Andromeda's exposure to the monster, and her rescue by Perseus is told on page 5442. Cepheus, the husband of Cassiopeia, sailed with the famous Argonauts.

Cassiopeia was pictured by the ancients in a southern constellation of thirteen stars, seated on her throne, and holding a palm leaf in her hand. Cepheus is near. Cassiopeia, as the constellation is called, can be recognized very easily in the sky in the form of an "m," or, as some see it better, a "w."

THE GREAT BEAR

LOOKING at this group of stars, so easily observed, for they never set in the Northern Hemisphere, people fancied they saw in them different objects. So the Greeks said: "It is a chariot"; the ancient Gauls called it Arthur's Chariot; the Americans, The Dipper; the English, Charles's Wain or The Great Bear. There are two bears really, a Great Bear, or Ursa Major, and a Little Bear, or Ursa Minor. This is the legend of how they came there.

Jupiter and Calisto had a son named Arcas. Juno, who was jealous of Calisto, changed her into a bear, and her son by mischance was on the point of killing her. Jupiter, recognizing her danger from huntsmen, changed her into a constellation. Arcas' kingdom was Arcadia, a happy land where people were taught by their king to till the ground and spin wool. One day, while hunting, he met a beautiful wood-nymph in trouble because the tree over which she watched was in danger from a river in flood. Arcas saved the tree by turning aside the current; then he married the nymph, and when he died left his kingdom to his three sons. Jupiter at his death turned him into a bear like his mother, so that he has since kept her company as a constellation.

THE PLEIADES

THESE seven stars were associated with seven beautiful sisters, daughters of Atlas, and named Electra, Maia, Alcyone, Taycete, Celæno, Merope and Sterope. They all married gods, except Merope, whose light is less bright because she was wedded to a mortal, Sisyphus, king of Corinth. Electra's light also diminished through grief after the fall of Troy, which her son Dardanus had founded.

The word Pleiades comes from a Greek word meaning "to sail," because this constellation shines well in spring, at a good time for sailors to start on a voyage. Because, too, of their association with *ver*, the spring, these stars are also called the Vergiliæ. From the earliest times, festivals and seasons were connected with the rising of the Pleiades.

The story runs that, in Bœotia, the giant Orion went in pursuit of the seven sisters, but they prayed to be saved from him, and they were changed into the form of doves. Now they are ever at a safe distance from him in the skies, at the back of the Bull, and behind its horns, where Orion cannot trouble them.

HERCULES WITH HIS CLUB

THE celebrated hero Hercules, son of Jupiter, was, of course, bound to be enthroned among the gods in the skies, so that the Greeks in a place of honor, pictured him with his club in his right hand, an apple-branch in his left, in memory of the apples of the Hesperides, and in a kneeling position.

The legend is that Hercules was fighting one day with stones, but had used them all. Then Jupiter, seeing the danger of his son, rained down a shower of round stones. These Hercules bent down to pick up, and throw at his enemies, and thus he overcame them. This is why he is shown kneeling.

Many are the stories of his prowess and marvelous physical strength, but the most wonderful were his twelve labors, on the performance of which the Delphic oracle promised him immortality. These included slaying the Nemean lion, the Hydra, or water-snake, and the monster birds; capturing a stag with hoofs of bronze and antlers of gold, the boar of Erymanthus, the mad Cretan bull, the mares of Diomedes, Geryon's oxen, and Cerberus, the dog of hell; securing Hippolyte's girdle and the golden apples of the Hesperides. By his own will his body was burned on a pyre, and his spirit passed away in a cloud to Olympus, where he married the goddess Hebe, and became immortal.

THE NEXT STORIES ARE ON PAGE 2105.

THE KING WHO DEFIED THE NATION

Charles Stuart believed that kings could do no wrong, and when king of England he trampled down the rights of the nation and cared nothing for the freedom of the people. The people rose in anger against the tyranny of the king, and armed men to fight—the Parliament and the nation against the king and the nobles. This picture shows Charles raising his standard at Nottingham, where the great Civil War began.

King Charles, who had set his people at defiance, was hunted up and down the land. Oliver Cromwell, a plain country gentleman farming in Huntingdon, raised a wonderful army, which fought the king from battlefield to battlefield and beat him everywhere. At last Charles was captured and tried as a traitor in Westminster Hall, where he was condemned to death. This picture shows the king departing from his trial.

WHAT THIS STORY TELLS US

WE have come to the most stirring time in the history of England, the time of the Stuart kings. The idea that kings could do no wrong filled the minds of the Stuarts, until they ruled so harshly that it seemed as if they had forgotten the Magna Charta. The old tyranny came back, and the king trampled on the rights the people had won. But the people would not let their freedom go. There came a farmer from Huntingdon who left his farm, who led the people against the king, who raised the finest army of men that has ever been known, who defeated Charles Stuart, imprisoned him, had him tried and led out to die for his sins against the people. For eleven years there was no king in England, and Oliver Cromwell ruled the Commonwealth. We read his wonderful story, and the full story of Charles I and the men of the Civil War, in the Book of Men and Women; but here we run quickly over these eventful times in this history, until the reign of the Stuarts came to an end.

THE TIMES OF THE STUARTS

CONTINUED FROM 1824

THE messenger who rode north at such breakneck speed to tell James Stuart that his cousin Elizabeth was dead did the journey in a few days, much to everyone's surprise. Now news is flashed between Edinburgh and London in a few seconds, and we travel the distance by rail in about eight hours!

So secure did James feel about the succession to the English crown that his journey south was a sort of pleasure excursion, taking three or four weeks. A few of his lords attended him, and they ambled along day after day, through the heart of the quiet country, in the pleasant spring weather, being entertained at fine houses on the way.

Three centuries had passed since the old Hammer of the Scots, Edward I, had so ardently desired that the north and south kingdoms should be united under one ruler—three centuries of constant war, now on one side of the border, now on the other. Yet the desired union of the crowns did not come about on the battlefield, but peacefully by inheritance, and by request of Parliament, when James VI of Scotland was crowned James I of England in the old coronation chair, over the old block of stone that the Scots had so hated to lose, within a few feet of Edward's resting-place in the Abbey. For another hundred years the two countries had their own parliaments and governments; but under the last of the Stuarts the union became complete.

Let Sir Walter Raleigh lead us into the Stuart times, the times when England began to spread beyond her old sea boundary; for he was one of the first to understand the real use of the discoveries of Columbus and Elizabeth's sea captains. James set his heart on finding gold and treasures that could be brought over in ships. What really was needed was for English people to go over the ocean and make new homes in the New World, and found states to be governed by the same laws as at home. Then the settlers, or colonists, must cultivate their new estates and grow food, not only for themselves, but for other parts of the world. It took many years for the nations on the east of the Atlantic to realize the wonderful extent and use of the lands on the west, and nearly all the sixteenth century passed away before they seriously put in claims to share in them.

The first settlers from every country had hard times to bear, and much failure. It was Sir Walter Raleigh who named England's first colony after Queen Elizabeth, Virginia, and James gave it a charter.

By this time Spain, Portugal, Holland, France, all had dominions on each side of the Atlantic, and very soon struggles and fights about the new lands arose, which led to nearly two centuries of war among the five greater nations of Europe.

This spreading out of empire across the ocean led to another cause of war. When the ocean became a pathway to the New World instead of a boundary to the Old, each nation wished to be mistress of the seas and to have the greatest number of ships upon them, manned by the most daring sailors. They wanted to protect their countrymen as they passed to and fro, whether they were bringing home rich treasures or "carrying" goods for other countries.

To-day the English have more shipping at sea than any other nation in the world; and they have spread out over the world, as colonists, more than any other people. We find the first steps toward this greatness in the days of the Stuarts.

THE BEGINNING OF THE GREAT WAR BETWEEN THE KING AND THE PEOPLE

James I had even stronger ideas about the rights of kings than the Tudors; he believed not only that as a king he could rule and do as he liked, but that, because he was a king, he could do no wrong. This belief, which he passed on to his sons, caused great trouble in England; and freedom had once more to be fought for.

An echo from the early days of James's reign is heard every year in London streets, which is a reminder of how real and bitter was the struggle three hundred years ago. We all know the words: "Please to remember the fifth of November, gunpowder, treason and plot."

Year by year poor Guy Fawkes is carried round the town to be burned in a bonfire at night. This old custom has been kept up in memory of the horror felt when he and his friends tried to blow up the king and Parliament by hidden barrels of gunpowder in the cellars under the House of Lords.

Soon after this a new plan was tried in Ireland to bring it into line with the rest of the kingdom. The owners of the land in Ulster were declared to have lost their rights to it by rebelling against England, and were driven out. English and Scotch settlers obtained these lands, and, being thrifty and industrious, they and their descendants have made the northeast corner of Ireland the most prosperous part of the country.

THE LITTLE BOAT THAT CARRIED THE PILGRIMS TO AMERICA

The settlers who landed at Jamestown, Virginia, in 1607, came to the New World to seek adventure or to better their condition in life; but others came for a different reason. Differences in religion had a good deal to do with sending people across the Atlantic, to settle in a land where they hoped to have more freedom. Those who preferred a simpler form of worship than was used in England were among the first to go, and gradually the fringe of English-speaking colonies spread along the coast of North America, to the Spanish settlements in Florida.

It was in 1620 that a little ship called the Mayflower crossed the stormy Atlantic, with about one hundred passengers on board. The long and miserable passage was no pleasure trip to the sad and earnest folk, and no warm welcome or comfortable quarters awaited them when at last they set foot on shore. But the granite boulder on which the feet of these Pilgrim Fathers, as they are called, first touched when they finally landed on American soil is still to be seen railed round and canopied on the shore at Plymouth.

James himself was such a strange mixture of learning and stupidity that a brother king called him the "wisest fool in Christendom."

THE HANDSOME YOUNG PRINCE AND THE GIRL IN PICTURESQUE CLOTHES

When he died, it was his second son, Charles I, who succeeded him, for the promising, clever Henry, the friend of Raleigh, died before his father. Charles's handsome face is a very familiar one, for a famous painter, Van Dyck, lived in his reign and painted many beautiful portraits, both of the king and his wife and their family. Very charming does Henrietta Maria look, with her girlish face framed in tiny curls, and very picturesque are her clothes. Unfortunately she was both young and foolish when she married, and she offended people in many ways.

THE PITY AND THE PATHOS OF IT ALL

The Royalist—By John Pettie.

Charles about to die.

The Puritan—By John Pettie.

The last walk of Charles the First, from St. James's Palace to Whitehall.

The burial of Charles Stuart at Windsor—From the picture by Ernest Crofts, R.A., now in Bristol Art Gallery.

The group of Stuart children is very interesting, and makes a delightful picture. There is the Prince of Wales, afterward Charles II, when a boy of seven, with his hand on a splendid big dog; the Duke of York, afterward James II, in a dress and cap that make him look like a girl; and Mary, a little copy of her mother, in her dress and curls, who afterward married a Dutchman, the Prince of Orange.

THE KING'S MESSENGER BATTERED IN VAIN AT THE DOORS OF PARLIAMENT

As soon as Charles began his reign, he showed that he believed even more strongly than his father that, being a king, he could do no wrong, and was thus above all law and able to rule as he chose. Englishmen had been fighting for hundreds of years to make it certain that the sovereign of the country should rule by law, and Charles's doings roused the nation into steadfast resistance.

Imagine, for instance, this scene. Charles was angry at some remarks made in the House of Commons, and sent his messenger to summon the members to his presence to be rebuked. A great patriot, Eliot, sprang to his feet, and in blazing anger defended the right of free speech in the House. As he spoke the doors were locked, and the king's messenger battered vainly outside. The Speaker, who rules the debate, was held down in his chair—because, being a friend of the king, he wanted to get out of it—so that the speaking might stop, and all the time, amid growing tumult and noise, loud cries of "Aye, aye!" supported Eliot in his claims for English liberty. He finished with words never forgotten: "None have gone about to break Parliaments but in the end Parliaments have broken them."

BRAVE JOHN HAMPDEN, WHO REFUSED TO PAY THE KING'S TAX

Eliot died in prison because he refused to take back his words, and Charles dissolved Parliament and ruled without one for nearly twelve years. During this time he trampled more and more heavily on the liberties of the country, and many people joined the Mayflower emigrants across the sea.

One of the many unjust things Charles did to exasperate the people was to force money from them in ways not allowed by law. John Hampden, a country gentleman, refused to pay and went to law with the king about it. The judges decided against him, to their deep disgrace; but the resistance of the brave man roused the nation to a still deeper sense of its danger. The growing anger of the people was like the mutterings of a storm getting ever nearer and louder.

When at last Parliament was called together again, a great leader was found in Pym, who had the splendid gift of being able to speak so well that he could persuade men to do as he wished. The storm was getting louder. Now imagine the king bursting one day into the House of Commons in a rage, demanding that Pym and his friends should be given up to him! That caused the storm to break. The country rose and armed men to fight—the Parliament and the nation against the king and nobles.

At first Charles had the best of it. The brave Hampden was killed in one of the first battles, and for a time the Civil War raged, as in the times of the Roses, up and down all England.

THE COUNTRY GENTLEMAN WHO LEFT HIS FARM TO LEAD THE PEOPLE

There was a plain country gentleman, Oliver Cromwell, farming his rich grass meadows in Huntingdonshire and traveling to London to sit in Parliament with Eliot and Pym, who now turned into a brilliant soldier and raised a model army, one of the finest armies ever seen. He trained and disciplined them, and fired them with an intense desire to fight for their own religion and government. "Trust in God, and keep your powder dry," was his famous advice to them one day when crossing a river. They were able to meet the soldiers of Charles, long used to arms; and later their leader could say with pride, "Truly they never were beaten at all." These were the Ironsides.

It was they who turned the tide against Charles. He had to flee from Oxford, where he had kept up a gay court, and at last fell into the hands of his enemies. His soldiers surrendered or fled; his possessions were captured; he was the poorest, the saddest man in the country. He was kept some time at various castles, one being Carisbrooke Castle on the Isle of Wight, where we

THE STRONG RULE OF OLIVER CROMWELL

* This picture shows Oliver Cromwell at the head of his famous army of Ironsides, as the men were called, on the battlefield of Dunbar, where they scattered the royal troops. Never was such an army as this, of which Cromwell said when the war was at an end, "Truly, they were never beaten at all." "Trust in God and keep your powder dry," was Cromwell's famous advice to his Ironsides when crossing a river one day.

After the death of King Charles, Oliver Cromwell ruled in England as Protector of the Commonwealth, and England rose to a proud position among the nations. But there were many troubles during the Commonwealth, and Cromwell ruled with an iron hand. This picture shows him angrily dissolving the Long Parliament, which had sat for twelve years and had supported the nation's rights against the king.

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can still see the green where he played bowls, and the window from which he tried to escape. A little later he was taken to London.

Between Charing Cross and Westminster lies a very wide road; the statue of Charles I on horseback stands at the Charing Cross end of it. At the other end, close to the present Houses of Parliament, is the famous Westminster Hall, built by William Rufus. To this hall, every day for a week, Charles was taken, to be tried for taking away the liberties of the people. He was condemned to death. Halfway down the broad road is the Banqueting Hall of the Palace of Whitehall; outside one of the windows he was beheaded in the sight of his people. His dignity and charm made many people love him and pity his cruel fate.

For eleven years there was no king in England. It became a free state, in which the power of government rested with the people—a commonwealth. Both the Parliament and the army were strong forces in these years; but the man who really ruled the country was Oliver Cromwell, now called the Protector. He was a strong and determined man, and did his best to make England great by setting things in order at home, and extending her power abroad. The poet Milton was one of his ministers.

After the death of Charles I both Ireland and Scotland declared for his son, and Cromwell went to Ireland to put down rebellion there. So harsh and cruel were the measures he used, so terrible were the sufferings of the people, that to this day Cromwell's name is hated in Ireland, and the memories of the bitter struggle have not yet died out.

Charles's son tried to become king after his father's death, but Cromwell was too strong for him, and he was defeated at Worcester. The prince had to cut off his hair and dress in a servant's clothes to escape being taken by Cromwell's men. For six weeks Prince Charles wandered about in great danger, and had many narrow escapes. One day he hid himself in an oak tree, and actually heard the soldiers talking about how soon they would catch him as they hunted about below him. But he escaped at last to a boat, and safely crossed the Channel, to wait in France for better times to come to England.

Some of the greatest names of the Commonwealth are held in remembrance by a plain stone close to the tomb of Henry VII, in Westminster Abbey, but their bodies are no longer there. There was Cromwell himself, with his friends, Ireton, his son-in-law, and Bradshaw, who was not afraid to say these bold words when Cromwell in great anger sent away the Long Parliament: "You mistake, sir, if you think the Parliament dissolved. No power on earth can dissolve the Parliament but itself; be sure of that."

In the midst of a terrible storm, on the day that Cromwell considered his great day—for he had won two battles on that date—the great spirit of the Protector passed away. He was worn out in mind and body, so hard had been the task of guiding the country through these troubled times.

His son Richard was a poor, feeble creature, and only ruled the country in name for a few weeks. One April, Cromwell sat on the throne of England; in May he wandered homeless, his trunk filled with congratulations from the monarchs of Europe. He came home at last to live in lodgings, and lived to be an old man.

There is a story told of a great pageant in which Queen Anne was the central figure. In the throng was an old man wearing the plain dress of a country farmer, and somebody, wondering how such a sight impressed a simple countryman, asked him, "Have you ever seen such a sight as that before?" "Never since I sat in her chair," said the old man. It was Cromwell's son, who had been all but king himself, and was then forgotten and unknown.

The name of Admiral Blake is another on the list. He was the first great seaman to have the honor of a state funeral in Westminster Abbey. His remains now repose in the churchyard outside. The very mention of his name seems to make one feel the whistling of the wind in the sails, and the dashing of the salt sea spray. How with great skill and bravery he fought the Dutch from the Hebrides to the Channel, and how they fought him! After Spain lost her sea power, the Dutch had held the first place, and great was the indignation of the veteran Van Tromp when Blake summoned his ship to salute the English flag. The fortune of war went up and

down; now the Dutch forced Blake into the Thames, and swept the Channel, with a broom at the admiral's masthead; now the English got the best of it in a running fight of four days.

Presently Blake appeared in the Mediterranean, and from this time English merchants had a share of the Mediterranean trade, foreign merchants beginning to trust their goods to be carried by English vessels. When the fleet in the West Indies took from Spain the island of Jamaica, England entered into a world-wide struggle, which was to lay the foundations of a world-wide empire.

he helped Cromwell in Ireland and Scotland. It was he who, after Cromwell's death, took the chief part in bringing back the son of Charles I to rule over the kingdom as Charles II.

There had been many troubles during the Commonwealth; the Puritan party, to which Cromwell and his friends belonged, had been often overbearing and very disagreeable, and the people, forgetting what they had suffered from the Stuarts, hailed the change with joy, thinking all would now go well.

Look at the group of the children of

Oliver Cromwell was no more really successful with his parliaments than Charles I. When the Long Parliament was planning to prolong its life, he abused the members, expelled them by force and commanded the doors of the House to be locked. The second parliament was dismissed in like manner, and the third, because neither would do his will.

Blake's last and greatest feat was his destruction of the whole Spanish fleet in the harbor of Santa Cruz, in the island of Teneriffe. Not a single ship escaped, but all were sunk or burned. Blake worked his own fleet out in the teeth of a gale. It is recorded that this great admiral did his best to make his sailors' lives more bearable, and that he was greatly beloved by them. He died as his ship entered Plymouth harbor after his last victory.

General Monck lies buried near the tomb of Mary Queen of Scots, the unhappy mother of James I. He was the great soldier of the Commonwealth, and, besides fighting at sea with Blake,

Charles I, and compare the faces of the two boys with their faces as grown men. There are many portraits of them, and their friends and courtiers, all with flowing, curly hair, fine velvet and embroidered clothes. The Puritans hated their pleasure-loving ways and smart clothes, and dressed themselves plainly, and cut their hair short. One of the greatest of the Puritans, John Bunyan, spent years in prison during Charles's reign for his religious opinions. While shut up away from his wife and little blind child, he wrote what has been called the most widely read book in the English language next to the Bible —The Pilgrim's Progress. (See page 5543.)

King Charles's sympathies were all against the Puritans. He went as far as he dared in trying to take away rights and liberties from the country, but openly said that he would do nothing that would "send him again on his travels." A very important act, called Habeas Corpus, was passed in this reign by which no Englishman could ever be kept in prison without a trial.

THE GREAT PLAGUE OF LONDON AND THE FIRE THAT SWEPT IT AWAY

In these times there occurred a great plague, a terrible disease which carried off thousands of men, women and children. It was like the Black Death in the reign of Richard II, and people fell ill so suddenly, and died so quickly, that no one felt safe. It was a wonderful thing that in the year after this plague smote London there broke out the Great Fire, destroying any traces of the plague that might be left behind. The fire spread all over the centre of the city, from the Tower to the Temple Church, in 1666. The tall monument near London Bridge marks the spot where it broke out. A writer who saw it describes the stones of old St. Paul's Cathedral rattling down and the molten lead running along the streets in a stream, the very pavements glowing with fiery heat. Four hundred streets, over thirteen thousand dwelling-houses, and nearly a hundred churches were destroyed. The king and his brother did what they could to stop the progress of the flames, by blowing up houses with gunpowder, so making a gap which the fire could not cross. Dreadful as it all was, it really was best for London that its unhealthy streets should disappear.

So when the Great Fire swept away the streets in which there had been so much sickness and misery, a new and healthier city was built.

England was brought very low about the time of the plague and the fire. All that Elizabeth and Cromwell had tried to do toward making it a power in Europe seemed to be undone by Charles II in his dealings with foreign countries. He received a great deal of money from the powerful king of France, Louis XIV, for promising to help him to secure part of the Netherlands; he even sold Louis the town of Dunkirk, near Calais, which Cromwell had taken because it commanded the Channel.

HOW MEN DRIVEN FROM OTHER LANDS FOUNDED TRADE IN ENGLAND

Can you imagine the feelings of the country about this, and also when the war was so mismanaged that the Dutch sailed up the Thames itself and burned the ships in the Medway? After this, for a time, it was the turn of the Dutch to sail proudly up and down the Channel, "monarchs of all they surveyed." Presently it was felt that France was getting too strong, and must not be allowed to encroach so much on Holland, and at last peace was made for a while.

All through the times of the Stuarts trade was growing. We have seen how the Flemish weavers helped to establish the wool trade; and more than once religious persecution in their own country sent away numbers of industrious men with their looms to set up in England, to its great profit. French silk-weavers, too, sought refuge there, and started their beautiful work, chiefly in the East End of London. We read that Queen Elizabeth was delighted with a great novelty as a present—a pair of woven silk stockings.

THE WOODEN WALLS OF ENGLAND BEGIN TO RISE

In Stuart times, frames for knitting were set up in the towns of Leicester and Nottingham, where now there are thousands of workers in the great mills. The linen and cotton trades, too, began to employ workers, though in a very small way, and most of the cotton brought from abroad was used to make candle-wicks.

In this seventeenth century coal began to be used in houses, chiefly in London, as it could easily come by water from Newcastle. People began to use it also to obtain heat for smelting iron, instead of wood. It was feared that before long all the forests would be cut down, for it took two loads of wood to make one load of charcoal, and two loads of charcoal to make one ton of iron.

Birmingham started to be a manufacturing town in that same century, ships were built on a large scale, and at the end of the century England was possessed of double the vessels that she had when the little "sea hawks" poured out of the harbors to tackle the Armada. Dockyards sprang up, such as those at Deptford and Woolwich, where the saw and the hammer were

busily used in making the wooden walls of Old England.

JAMES II LOSES HIS THRONE AND HIS QUEEN ESCAPES WITH HER BABY

When Charles II died, his sailor brother became king, as James II. He took money from the French king, as Charles II had done, and there were many struggles and tumults, both with the people and the bishops, about the things James did contrary to law, which interfered with the rights of the people. As we look at his heavy face we can understand his want of tact and his failure in governing his people. In a short time they could stand him no longer, and William of Orange, who had married his eldest daughter, Mary, was invited from Holland to take his place.

James's wife, Mary of Modena, fled to France with her baby boy under her cloak, under cover of night, when her husband lost his throne. When the baby grew up, his friends called him James III, but those who were against him called him the Old Pretender, because he claimed, or made pretense, to be king. Both he and his son after him, called the Young Pretender, or Bonnie Prince Charlie, made many attempts to get back the throne which James had lost, but they all failed, and the succession remained with his two elder daughters, who were Protestants.

THE POWER OF PARLIAMENT IS ESTABLISHED FOR ALL TIME

A very important act was passed at the beginning of William and Mary's reign, to make quite clear for the future what power the sovereign of the country should possess. The old principles that we have seen fought for over and over again since the time of John came up once more—that Parliament must make and unmake laws; that Parliament must settle what taxes are to be paid; that speech in Parliament must be free.

The French helped James to make a last stand in Ireland, where William won the battle of the Boyne. For nearly ten years fighting went on with France. The Scots were against William for some time, but gave in when they saw it was useless to try to get James or his son back.

Mary's sister, Anne, became queen next. A great war broke out during the same year with France. The old king, Louis XIV, who had driven out the silk-weavers, had bribed Charles II and his brother, had helped James II and fought William III, now wished that his grandson, the king of Spain, should also succeed to the French throne; but as this would have given too much power to one man in Europe, England, Holland and most of the German princes united to prevent it.

"Patience will conquer all things," was the Duke of Marlborough's favorite motto, and the victories of this time for which he is famous are among the greatest in any history. They decided that the two crowns of France and Spain should not be united, and that the Stuart Pretender should not be helped any more. England also obtained the right of sending *one* ship a year to the South Seas. Who can count how many she sends there now?

Marlborough's wife, Sara Jennings, a beautiful and accomplished woman, had at first great influence over Queen Anne. When, however, the duchess became a Whig, because of the Tories' opposition to the war, her influence began to grow less and her temper became more and more violent. A young kinswoman, Abigail Hill, supported by the Tories, succeeded her in the queen's favor, and at last both the duke and duchess were forced to live away from England.

ENGLAND AND SCOTLAND ARE UNITED AS ONE NATION

In the midst of the war the final union of England and Scotland was completed, to the great gain of both countries. The name was henceforth Great Britain. The Scottish National Church and the old Scottish laws were left untouched; the Parliaments were united, and trade was thrown open. On the one side the English gained much from the friendship and help of the Scotch, and the Scotch had better chances to enlarge their trade and get their country into good order.

The meeting of the first British Parliament was a grand affair. Each Scottish lord was led to his place by two English lords, and Queen Anne, in her fine robes, made a speech of welcome.

The flag-makers must have been busy, for the white cross of St. Andrew on a blue ground had to be added to the red cross of St. George on a white ground. But the Union Jack was not yet complete.

THE NEXT STORY OF ALL COUNTRIES IS ON PAGE 2097.

THE STRANGE WOODEN HORSE OF TROY

The Trojan War was ended, after ten years, by Ulysses. The Greeks built a huge wooden horse, hid some soldiers in it, and pretended to sail away. The Trojans came out to draw the horse into the city, and finding the gate too small, broke through the wall. In the night the Greeks returned, and their friends came out of the horse and opened the city gates while the Trojans slept. So the Greeks captured the city.

THE FIRST GREAT BOOKS

CHILDREN who read Lamb's Tales from Shakespeare think them very old stories, but we are not to suppose that they are among the oldest. Indeed, they are like stories of yesterday compared with others that exist in the world's great library. The oldest story that we know of is called The Shipwrecked Sailor, and was written in Egypt 2,500 years before the birth of Jesus. The idea of Sindbad the Sailor may have been taken from it. But the oldest real books are the Iliad and the Odyssey, supposed to have been composed by the Greek poet Homer, between 800 and 1,000 years before the Christian Era. Perhaps he brought together the work of other poets as well as his own. The greatest Roman poet, Virgil, was born just 70 years before Christ, and his most famous work is the Æneid. These three may be called the first famous books.

THE STORY OF THE ILIAD

THE WAR FOR A STOLEN QUEEN

CONTINUED FROM 1904

WE should surely know the meaning of the word "Iliad" before we can listen to or read the story. It is the English form of a Greek word that means "about Ilium," and Ilium was the name of a town that stood on the coast of Asia Minor. It is usually referred to in English as Troy, and it was the capital city of Troja; but it was known to the Greeks as Ilium. Its inhabitants were called Trojans. The Iliad, an epic poem, written by Homer, a Greek poet, nearly three thousand years ago, tells of a great war carried on by the Greeks against the Trojans; but what is true in it and what is the fancy of the poet we cannot very well say, as fact and fiction are mingled together.

The king of Troy was called Priam and his wife Hecuba. Of their many sons, Hector was famed for his bravery and Paris for his good looks. It happened that Paris was sent on an embassy to Menelaus, king of Sparta, in Greece. This king was married to Helen, a woman so fair that she was thought to be the most beautiful woman in all Greece. When Paris arrived in Sparta, the king was absent, and Paris was false to him. He made Helen a captive and carried her off to Troy. Greece, which is a land of many islands, was not then united under one king, but had many independent rulers and princes. So when the king of Sparta found that his queen had been stolen away, he called together a great meeting of the princes, and his own brother, Agamemnon, was elected "sovereign lord of all the Greeks" to lead them in a war against the Trojans for the recovery of Helen. At the marriage of Helen and Menelaus the Greek princes had promised to defend the beautiful Helen if any need arose.

The blind Greek poet who lived nearly 3,000 years ago and composed the Iliad.

The story then goes on to tell us how the Greeks made preparations for the war, how the army was reviewed, and how the boats for carrying the soldiers were equipped.

It tells also of the many famous warriors who were to take part in the war. Chief among these was Achilles, the bravest of the Greeks; then there was Ulysses, the wisest; while Nestor was the oldest and most experienced of them all. When all was ready,

the mighty army set sail for Troy, and landing on the shore, soon laid siege to the city. For ten long years the siege continued; battle after battle was fought and also single combats between the leaders, but no decisive victory was won.

Thus nine of the years had worn away when trouble began among the Greeks themselves. A great quarrel arose between Agamemnon and Achilles, when a captive girl who had been given to Achilles to be his slave was taken away by Agamemnon. As a result of this quarrel Achilles withdrew to his tent and would not support Agamemnon in any of the next skirmishes that took place between the Trojans and the Greeks. Growing ever bolder because the mighty Achilles fought no more, the Trojans now began to press the besiegers. Fearing that the Trojans might even score a victory, the noble Greek Patroclus, the dearest friend of Achilles, dressed himself in the armor of that powerful warrior, and led the Greeks once more against the Trojans. He drove them back into their city, but fell, mortally wounded.

Achilles had now more reason than before to make war against the enemy that had killed his well-loved friend.

Achilles was the bravest of the Greek soldiers who fought in the war against the Trojans.

Arrayed in a new armor made for him by Vulcan, he went forth to avenge Patroclus, and was met by Hector, the finest fighter of all Troy. Then took place the greatest battle of the long war. Hector soon fell before Achilles in his wrath, and the body of the Trojan prince was dragged three times around the city by the chariot of his conqueror. Then it was given to Hector's father, Priam, who bore it back within the walls of Troy, where the dead hero was mourned by Hecuba, his mother; by Andromache, his wife; by the captive Helen, and by all the Trojans. A great funeral was given to the hero of Troy.

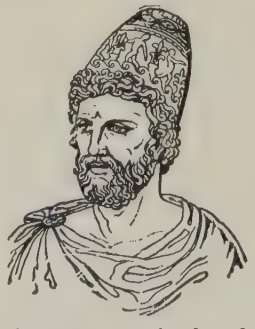
Perform, ye Trojans! what the rites require,
And fell the forests for a funeral pyre;
Twelve days, nor foes nor secret ambush dread;
Achilles grants these honours to the dead.

Thus commanded Priam, the king. With a short description of the final honors paid to the dead hero, the story ends. But this, of course, was not the end of the war. The chief purpose of Homer's long and famous poem is to show what Achilles did during the siege of Troy, and not to give a complete account of the war.

THE STORY OF THE ODYSSEY

AFTER the Trojan War the Greeks returned home, but Ulysses was fated to wander for many years before he regained his native land; and the Odyssey contains the stories of his adventures during those long years. The Greek name for Ulysses was Odysseus, and so the word "Odyssey" means "about Odysseus."

When the Greeks set sail from the coast of Asia Minor to return to their own beautiful homes, none of the princes was more anxious to regain his native land than the wise and brave Ulysses. But, in spite of all that his sailors could do, adverse winds drove his ships far from the isles of Greece. At home his wife Penelope and his son Telemachus were waiting for him, but they had to wait for ten long years after the Trojan War, and during those years the wanderer had twenty adventures. We can mention only a few here.



Ulysses was a princely soldier of Greece, who wandered by sea and land for many years after the Trojan War.

Instead of being carried toward Greece the ships of Ulysses were blown along the coast of Asia Minor; and being sore pressed by hunger, he and his men at length were forced to land and attack the inhabitants of a small town, who fled before them. The Greeks, with plenty to eat and drink,

gave themselves up to merry-making. Meanwhile, the inhabitants came back and attacked them, slaying more than half of the sailors who had landed. The others had a narrow escape in returning to their ships.

Ulysses and his men who thus escaped landed afterward on the island which we now call Sicily, and here they wandered about until they came to a great cave. In this cave were huge pans of milk, and the place showed other signs of being inhabited. It was, indeed, the home of one of the fabulous giants who, like the gods and goddesses, had their abodes in far-away places where ordinary mortals sometimes came upon them. The giant was named Polyphemus, and an uglier or more cruel giant it would be difficult to imagine. He had only one eye, and it was set in the middle of his forehead. He was chief of a race of one-eyed giants called Cyclops.

By tying each of his men below a giant sheep, after he had blinded the giant, Ulysses escaped with his men from the cave when the blind giant drove the sheep out in the morning.

Ulysses and his men were waiting in the cave that evening when the giant came home, driving before him a flock of giant sheep, and rolling before the entrance a stone which twenty ordinary men could not have moved. To him Ulysses went forward, and offering a skin of wine—for in those days bottles were made of skins—pleaded for mercy for himself and his men. The giant drank the wine and was delighted with it. He promised a boon to Ulysses for his gift; but as he immediately proceeded to devour two of the Greeks, it was clear they could not hope for any mercy from this monster.

After his long years at Troy and his many adventures, Ulysses returned safe to his wife and his son.

Polyphemus then asked Ulysses to tell him his name; but the prince was too wise to let him know who he was, so he replied:

"No-man is my name.
By that distinguished from my tender years,
'Tis what my parents call me, and my peers."

The giant then: "Our promised grace receive,
The hospitable boon we mean to give:
When all thy wretched crew have felt my power,
No-man shall be the last I will devour."

Six days of terror passed by, and the giant each evening reduced the followers of Ulysses by two before the wise prince hit upon a way of escape. On the seventh night, while Polyphemus lay stretched upon the floor asleep, Ulysses sharpened a great stake of wood, and, assisted by his men, drove it into the eye of the giant, whose roars of pain awakened others of the fabulous inhabitants of the island; but they could not enter, owing to the stone that blocked the cave. So they called to their great chief to know who had hurt him, and from his den he answered:

"Friends, No-man kills me; No-man, in the hour
Of sleep, oppresses me with fraudful power."

To this they called back:

"If no man hurt thee, but the Hand Divine
Inflict disease, it fits thee to resign."

Then they went away and left him. But all the Greeks together were unable to move the stone, and so they had to wait till dawn, when the giant himself, now blinded, pushed the stone away to let his flock of enormous sheep go forth. He himself sat by the entrance, meaning to prevent the Greeks from escaping. But Ulysses had

been wise enough to expect this, and had had one of his men bound under each of the sheep, so that as the animals passed through the door they carried all the Greeks with them. Ulysses and his crew escaped to the ships. And so ends the third of his wonderful adventures.

A stranger adventure still befell the Greeks when in their wanderings they came into the hands of a witch named Circe, who gave them wine to drink that turned them into beasts. Here, again, Ulysses was too wise to be caught by any snare, and refused to drink the wine. It was well for him that he did, as his wisdom made the witch admire him, and for his sake she restored all his companions to their natural shape.

Many of the adventures of Ulysses are full of meaning, and teach us valuable lessons if we care to take them. One of the most interesting is the adventure of the Sirens, who were beautiful singing maidens that sat along the shore and sang so sweetly that sailors were tempted to come to land. But these Sirens were really furies, who killed the men that landed and strewed their bones along the shore. Here again, the wisdom of Ulysses secured the safety of his crew. He put wax in the ears of his sailors so that they might not hear the singing of the Sirens, and thus they rowed safely past that land of peril.

Their next adventure was to sail safely between a rock called Scylla and a terrible whirlpool called Charybdis. This Ulysses succeeded in doing But we must now come to the end of these extraordinary adventures and see Ulysses landed safely on the barren shores of Ithaca, the Greek island of which he was the king.

Twenty years had passed since he first sailed away to take part in the great war against the Trojans, and all this time his wife Penelope, who was famed for her goodness, her beauty and her wisdom, had been patiently awaiting his return. Many princes had been anxious to marry her, and had come to the palace, saying: "Ulysses is dead, or he would have returned here now." But she had refused them all, telling them she would never wed again until she had finished weaving a robe, and as she raveled out each night what she had woven during the day, the robe was never finished, for she did not believe Ulysses was dead.

When Ulysses reached his palace some of the princes who wished to marry Penelope were there. Nobody but his old nurse and his dog knew the king, who was so changed in his twenty years of wandering. But Ulysses told his son Telemachus who he was, and together they killed the princes who had been annoying Penelope. Then Ulysses sought his wife, who at first could hardly believe her husband had returned, and was overjoyed to think her wise and noble king was safe at last and all his wanderings were over.

THE STORY OF THE ÆNEID

THE aim of Virgil was to add historical or legendary dignity to the new imperial house of Augustus Cæsar. To do this he followed the style of Homer, who had written nearly eight hundred years before. He traced the origin of the Roman people, before the foundation of Rome, to a band of Trojans who safely withdrew from Troy after its capture by the Greeks.

Virgil indicates at once the subject of the story he is to tell.

Arms and the man I sing, who first from Troy,
Fate exiled, reached the shores of Italy.
On land and deep much tossed, the hero felt
Heaven's lash, for cruel Juno's mindful wrath.
Much, too, his pain in war ere he might found
His city, and bring into Latium
His gods. Hence sprang the Latin race, our sires
In Alba, and the walls of lofty Rome.

Virgil takes his readers at once to Carthage, a city supposed to be under the special guardianship of the goddess Juno. There, according to the plan of the poem, Æneas is to relate, eventually, the story of the fall of Troy and his wanderings. His escape was made against the wishes of the goddess, for she foresees the future rivalry between Carthage and the Roman descendants of the fugitive Trojan. So she desires to prevent him from reaching Italy. This is how Carthage is introduced:

Carthage, an ancient State which settlers held
From Tyre, faced Italy and Tiber's mouth
Far o'er the main. This city, rich in wealth,
And valiant in the rugged ways of war,

Did Juno cherish more than other lands;
She harboured the design, if fate allowed,
That this should be the empress of the world.
But she had learned a race of Trojan seed
Would yet o'erturn these Tyrian citadels;
A people ruling wide, in pomp of war,
Would ruin Libya; 'twas destiny!
In fear whereof, recalling battles old
Once waged in war for Greece, her favourite,
The goddess sought to fend from Latium
Afar, imperilled everywhere at sea,
Those Trojans who had 'scaped from Grecian sword
Or fell Achilles: so for many a year
Fate-driven over every main they roamed—
Such task it was to found the Roman race!

Æneas and his followers have just sailed from Sicily, and Juno induces Æolus, King of the Winds, to raise a storm against them. Some are lost, but Neptune rebukes the Winds because the storm was raised without his permission. Æneas lands safely on the shore of Libya, the part of northern Africa where Carthage is built.

Venus now supports the cause of Æneas, and complains to her father Jupiter that Juno is persecuting the long-suffering Trojan and his men. This is her plea:

O thou, whose everlasting sway controls
Both man and god with direful thunderbolt,
Wherein hath mine Æneas angered thee,
Or how have Trojans sinned that, after woes
So great endured, the whole round world for them
Is shut, to bar the way to Italy?
Sure thou didst promise that in lapse of years
From them should spring the Roman leader who,
Of Teucrian blood revived, should rule the waves
And land in absolute supremacy.

Jupiter comforts her by giving her a glimpse of the future. Æneas, he tells her, will reach Italy and establish himself in Latium. He will be followed by his son Ascanius, who will reign as a great prince in Alba Longa. Three centuries afterward his Trojan descendant Romulus will found Rome.

And he shall call the Romans by his name.
I set nor check nor period to their power;
I give them boundless empire. Juno dread,
Who now o'eraweth land and earth and sky,
In altered mood shall join with Jove to guard
The Romans, lords of all the toga'd race.

Further, Jupiter foretells that Rome will revenge the fall of Troy by conquering Greece, and the deified Cæsars will inaugurate a reign of peace in a world-wide empire. While this conference is proceeding in the celestial regions Æneas is wandering on the Libyan coast, with his faithful friend Achates. There Venus appears to them in the guise of a huntress-maid, and informs them that they are in the realms of Dido, queen of Tyre, who is building herself a new capital at Carthage. She tells Æneas also that other ships of his have reached the coast safely, and directs him to the queen's palace. It is only as she turns to leave him that he recognizes her as his goddess mother. As a parting gift she wraps him in a mist of invisibility. Overlooking Carthage, he and Achates watch the busy building of the city. When they reach a temple within a grove they are touched to see that the decorations on the walls represent the wars of Troy. Æneas exclaims:

What spot, Achates, or what land on earth
Teems not with our sad Trojan history?
There's Priam—look! Here, too, hath fame its meeds.
Tears haunt the world; man's fortunes touch man's heart.

While the wanderers stand in wonderment Queen Dido and her courtly train arrive. She seats herself on a throne of state in the temple to transact the business of her kingdom. As Æneas stands by invisible with Achates some of his shipwrecked comrades approach and appeal to the queen, telling her they are Æneas' men and in need of succor. She receives them graciously, saying:

Oh, clear your hearts of dread, and banish care!
Who should not know Æneas' folk and Troy,
Men, manly deeds, and flames of such a war?
Nay, not so dull are our Phœnician souls.
The city which I found is yours: so beach
Your ships: the Trojan and the Tyrian
Shall find in Dido an impartial queen.
Ah! would that, wafted by the self-same wind,
Your prince Æneas also graced my court!

When Dido is about to send messengers forth to search for Æneas in the hope that he, too, may have escaped, the mist of invisibility clears away, and he makes himself known.

Then doth he thus address the queen, and speaks
Sudden to their surprise: 'Lo, I, the man
Ye seek, am here—Æneas, Trojan born,
Late rescued from the waves of Libya!
Lady, that hast alone felt ruth for Troy
And Troy's unutterable woe, who now
Dost share thy town and home with us, whom Greeks
Have spared for weary round on sea and land

Of endless hazards and for beggary:
Queen Dido, to repay thee worthy thanks
Is not within our reach, nor in the reach
Of all the Dardan race throughout the world.
If deities there are who mark the good,
If justice is, and consciousness of right,
Then may the gods reward thee fittingly!
What happy age did yield thee? Say, what line
Owned thee for its fair scion? While the streams
Shall seaward run, while mountain shadows course
Athwart the vale, while heaven feeds its stars,
Ever shall Dido's honour, name, and praise
Bide in my heart, whate'er the lands that call.'

Hospitality is offered freely to all by Dido. At the close of a great banquet she invites Æneas to tell the story of the final overthrow of Troy, and of the wanderings for seven years of himself and his companions.

Accordingly he tells how, by the counsels of Ulysses, the Greeks erected outside Troy an enormous wooden horse in which they concealed a number of Greek soldiers. Having wheeled it near to the gates of the city, they left it there and pretended to withdraw to their ships and give up the siege. When they were gone, the Trojans, with great rejoicing, dragged the wooden horse into the city. But at night the Greeks returned. Their comrades, descending from the horse, fired the city and opened the gates. Before the Trojans could rally, everything was lost, and their king, Priam, was slain. Then Venus appeared to Æneas and commanded him to escape. So he carried off his father Anchises on his shoulders, and, his son Ascanius following him, left the city. His wife had already perished in the fighting.

Æneas then tells the story of his wanderings, similar to the Homeric story of the adventures of Ulysses. It is only gradually that the Trojan realizes that the land of his quest is Italy. He visits Thrace, passes the Ægean Isles, reaches Crete and passes on to the western shores of Greece. At last he learns from the seer Helenus that Italy must be his destination. On reaching Sicily his father Anchises dies. The next stage of the journeying is through the tempest to Carthage.

The part of the epic which follows develops the tragedy of Queen Dido. She falls in love with Æneas. Juno favors the attachment, as it may tend to keep Æneas away from Italy. A Libyan prince who has been rejected by Dido supplicates Jupiter. The god responds by sending Mercury to order Æneas to continue his journey to Italy. Knowing how deeply Dido is in love with him, Æneas shrinks from telling her of his intention to leave Carthage. But she discovers his preparations, upbraids him, and appeals to him to stay in Carthage as her husband. But he is acting under the compulsion of the gods, and he replies:

Brief words shall fit the case.
Imagine not I hoped by stealth to hide
My flight: I never held the marriage torch
Before thine eyes, or entered such a bond.
But now Apollo points to Italy:
So Italy is love and fatherland.
If towers of Carthage and a Libyan town
Can glamour, lady, thy Phœnician eyes,
Why grudge to Trojans the Ausonian soil?
Cease, then, to tire thyself and me with plaints:
'Tis not unbid I follow Italy.

Dido now regards herself as a woman scorned, and fiercely answers:

I was mad
To welcome him, a shipwrecked mariner,
To give a beggar share of sovranty!
I hold thee not; nor yet refute thy words.
Go, follow "Italy" before the breeze;
And seek for kingdoms o'er the waves. I hope
Midway, if powers of goodness can avail,
Thou wilt drain punishment on rocks,
And often call on Dido's name. Far off
With murky fires I will pursue, and when
Chill death hath severed soul and frame, my ghost
Shall haunt thee everywhere. Wretch, thou shalt rue
Thy guilt, and I shall hear; the bruit thereof
Shall reach me in the lowest depths of hell.

Then, in a frenzy of despair, she builds a funeral pyre, which, she says, is to burn all tokens and memorials that can remind her of the Trojan sojourner whom she regards as unfaithful to love. But on it she takes her own life as Æneas sails away toward Sicily, and its flames light his passage from the coast of Libya.

After a stay in Sicily, where he honors his father's memory by a series of games, Æneas passes on at last to Italy, landing at Cumæ, in Campania. There lives in a cave a far-famed Sibyl, and her he consults as to the dangers ahead of him, and a visit which he wishes to make to his father in the nether world. He is told he will be safe in the shades so long as he carries a magical Golden Bough. This he manages to secure by aid from Venus.

The Sibyl accompanies him where

Before the door—the opening jaws of hell—
Grief and the Venging Cares have set their couch;
There wan Diseases dwell and dolorous Eld,
Fear, ill-advising Famine, loathly Want,
Dread shapes to look upon—and Death and Toil,
Then Death's own brother Sleep, and Evil Joys
Of mind, and on the threshold full in view
Death-dealing Warfare.

Past the tree of Empty Dreams, and appalling but unsubstantial monsters of Shadowland, the prophetess and hero make their way to the eerie waters over which the boatman Charon ferries the spirits of the dead. The dead crowd the banks, but only those are allowed to cross whose bodies have found a grave. At the sight of the Golden Bough, Charon ferries the Sibyl and Æneas across the Styx. There the wanderer has a fleeting glimpse of Dido, "and knows her dimly through the mirk." After meeting hero-spirits and passing the terrible prison-house of Tartarus he leaves the Golden Bough at Pluto's palace, and finally reaches the Elysian fields.

Here he finds his father's spirit contemplating the fates and fortunes of his descendants. Æneas shares in the vision leading up to the glories of imperial Rome, when Augustus Cæsar is enthroned.

This, this is that same hero whom so oft
Thou hast heard promised thee, of birth divine,
Augustus Cæsar, who shall found again
The Age of Gold in Latium.

Thus, in vision, the story of Rome is brought up to date in flattery of the reigning emperor. Æneas is then instructed respecting the wars in which he will have to fight in Italy. These wars provide the remainder of the poem. His vision of the future ended, Æneas, with the Sibyl, returns from the Shades to ordinary life through the Ivory Gate of Sleep.

Æneas, having reached the Tiber, secures the promise in marriage of the hand of the Princess Lavinia, daughter of King Latimus. This leads to war in accordance with prophecies of the Sibyl that a foreign bride would again imperil Trojan success. In the end, after desperate warfare, Turnus, the chief opponent of Æneas, insists on encountering him in single combat. When they meet, Turnus finds his strength paralyzed by the interposition of the goddess who is the guardian of Æneas, and is slain.

With Æneas thus safely settled in Italy Virgil's epic closes, and the continuance of the further legendary story of Rome is left for other narrators. Into his own twelve books, however, Virgil, though we know he did not fully satisfy himself, has brought an immense amount of Roman legend and belief which throw much light on the national thought and religion.

There have been many translations of Virgil's Æneid. These quotations are from Dr. J. W. Duff's blank-verse version.

Priam was the king of Troy and father of Paris. After the Greeks got into the city by the trick of the wooden horse, Priam and his princes, as well as most of the Trojan soldiers, were killed.

ST. FRANCIS AND ST. NICHOLAS

This picture, from an old painting in the Louvre by the Italian artist Giotto, shows St. Francis of Assisi preaching to the birds, his "sisters." He taught that since God is the Father of all, his creatures are all brothers and sisters. Believing this, St. Francis was loving and cheerful.

A rich young man named Nicholas, walking through the streets of his native town, overheard the lamentation of a starving father and his daughters. Hurrying home, Nicholas took one of his three lumps of gold. Climbing on tiptoe, he could just reach an open window in the poor man's house, and through it he thrust the gold. For three nights he did this. His many kind deeds won him the name of St. Nicholas, or, as we often call him, Santa Claus. This picture is from an old painting by an Italian artist, Lorenzo di Bicci.

Photos, Metropolitan Museum of Art.

STORIES OF THE SAINTS

A SAINT is a good man or woman whose life has been spent in charitable work, in devotion to God, and in true repentance for any sin. In olden times, when nearly all Christians were ruled by the Church of Rome, many noble men and women, whose lives had been full of goodness, were, after death, made saints by the Church, or "canonized," and a day of the year fixed for paying reverence to their memory. In time many beautiful legends, partly true but largely imaginary, came to be told about these saints, and these legends are well worth reading, even if we regard them only as beautiful stories. Here we read of the lives of some of the best known of these saints.

THE LITTLE POOR MAN OF ASSISI

CONTINUED FROM 1866

THERE lived in the town of Assisi, in Italy, in the thirteenth century, the son of a very wealthy merchant, and his name was Francis. He was a handsome bright-eyed, merry-hearted boy, and as he grew up to manhood he lived only for pleasure and excitement. He became famous for the wild way in which he spent his money, and even set himself to outdo the sons of noblemen in grandeur and vanity.

But in the midst of his wild and foolish life there came to him a voice from heaven, and he saw all at once how foolish and vain he had been, for it is a madness to take delight in rich raiment and to think only of bodily pleasure, when every day we live only carries us nearer to the mystery of death.

Francis gave up his mad ways and set himself to serve Christ. He put off all his rich clothes and lived like a beggar. His father was furious. His old companions pelted him with mud. Nearly everybody thought that he was mad. But some people began to perceive that Francis was indeed a disciple of Christ. For he did not rave, he did not shout, he did not make himself a fool in people's eyes. No, he was the same cheerful, bright-eyed, happy-minded man, but with this difference—that all his cheerfulness came from love of God.

And this was the secret of St. Francis. He adored poverty. If, said he, Christ became a poor carpenter's son for us, surely we ought to make ourselves poor for Him. And he found a deep joy in poverty. He spoke of poverty as a lady, and said he had married this beautiful lady of poverty. He wore a rough brown dress, ate simple food, and spent all his time in teaching people not to desire riches and greatness, but to desire poverty—that is to say, to love God so much that everything rich and grand and magnificent appears silly and trivial and unworthy.

His love for God included love of the beautiful earth which God has made. He hated cruelty. He told people to love "our sisters the birds," and even spoke of the wind as "our brother," and the rain as "our sister." He felt that all things are brothers and sisters, and that God is the Father of all. Because of this he could always rejoice and sing.

For six hundred years men have loved St. Francis, whom we call the "Little Poor Man of Assisi." He has taught us all, even the wicked and the foolish, that we *can* change and *can* become better, that we can grow to resemble the beautiful and sinless Christ.

St. Francis is dear to us for many reasons: but perhaps more than for anything else he did or said, we remember him gratefully for just this simple teaching—that we should never be unkind to birds or beasts, but should treat them all as brothers and sisters, and spread the love of God among all living things.

THE GIANT WHO CARRIED THE POOR

HOW OFFERO BECAME ST. CHRISTOPHER

AN old hermit was sitting in his cell one day, when there appeared before him a mighty and huge man, who said his name was Offero, and told him the strangest of stories.

"I was strong from my youth up," he said, "and beat every comer at games and sports. But I wearied of these idle things. A voice within me drove me forth, and would not let me be satisfied.

"So I put on my armor and took my sword, and journeyed till I came to the palace of the greatest king on earth. Him I served, until one day I saw him make a sign on his forehead whenever the minstrel who sang before him made mention of the Evil One. I would not serve him longer, because he feared the Evil One, and was not a brave man. So I journeyed on, till in the centre of a deep, dark forest I found Satan keeping his court.

" 'Art thou the bravest king on earth?' I asked. And when he said that he feared nothing, I took service with him.

"But one day I saw him cower from a little wooden cross set up on the highway, and I challenged him, saying:

" 'What! are you the bravest man on earth, and fear a piece of wood?'

" 'It is not the cross I fear,' said he, 'but Him who once hung there.'

"So I left him, and have ever since striven to discover who is this Christ who hung upon the cross. And now the voice within me has brought me to you. Tell me, I pray you, the story of Christ."

The hermit told him, and the giant lifted his great sword to the sky, and swore that he would thenceforth serve only Christ. The hermit said that Christ did not wish men to fight for Him, but to fight against evil by gentle living and prayer.

Offero said that might well be true; but it was evident that God had not given him great muscular strength for nothing, and that strength he would devote to Christ. So the hermit took him to the banks of a wide and angry river, and bade him dwell there and help poor people to go across. This pleased Offero well, and he built a hut, and tore up a pine tree for a staff, and when poor people wanted to cross the angry flood he carried them over, saying he did it for the love of God.

One wild night a little child came to him to be carried across, and Offero set him on his shoulder and waded into the foaming stream. But as he went the child grew heavier and heavier, so that Offero's knees bent under him. Yet he got across, and when he set the child down he said:

"How is it that you are the heaviest burden I have ever carried?"

Then the child became glorious with a wondrous light, and said to Offero:

"Heavy did I seem to thee because I bear the sins and sorrows of the whole world. I am Christ. And because thou hast been kind to the weak, and hast borne Christ upon thy shoulders, I will call thee henceforth Christopher."

Then the Child vanished, and Christopher knelt in the darkness.

ST. URSULA AND THE TEN THOUSAND MAIDENS OF BRITAIN

A MOST wonderful sight was seen one day in Brittany. In a great meadow were gathered together more than ten thousand of the loveliest maidens from Britain, and on a throne was seated the Princess Ursula of Brittany, telling these British maidens the story of Jesus Christ.

Princess Ursula was the only daughter of the king of Brittany, and so lovely that the story of her beauty had passed into all lands. Prince Conon of Britain desired her for his wife, and she told him to send her ten of his greatest ladies, each escorted by a thousand maidens, and to wait for her three years. Then she taught these ladies to be Christians, and set out with them to visit foreign lands, while Prince Conon at home gave himself up to a study of Christ.

Princess Ursula and her great company of ladies made a wonderful impression wherever they went, and many people became Christians because of them. And Prince Conon's love waxed so strong that he came and followed her, with many great bishops and clergy, including even the pope of Rome. And Conon longed for the time when Ursula would be his bride; yet was he very

ST. CHRISTOPHER AND ST. URSULA

Offero the giant once stood at the edge of an angry flood, when a child came to him to be carried across; he set him on his shoulder and waded through, but the child grew heavier. At last, all glorious with a wondrous light, he said, "Heavy did I seem because I bear the sins and sorrows of the world. I am Christ; and as thou hast been kind to the weak, and borne Christ upon thy shoulders, I will call thee Christopher."

The beauty of Princess Ursula, the only daughter of the king of Brittany, was known in all lands, and the princess and her ladies went everywhere to tell men of Jesus. One day they came to the court of a king whose wickedness Ursula denounced so bravely that the king seized an arrow and shot it into her heart.

The upper picture was painted by Joachim Patinir, the lower by Memling—both early Flemish artists.

happy to go across the world with her, spreading knowledge of the blessed Savior. And Ursula loved him, but she knew that God had a great work for her to do. So they all went together, telling people of the love of Christ.

But in this pilgrimage Ursula came to a place where the heathens of the land rose against her, and they slew the bishops and clergy, and Prince Conon and his knights, and all the women except Ursula, whose lovely face dashed the courage of the most brutal men, and stayed the hands of the most savage.

So Ursula was brought before the king, and he said he would marry her; but she spoke to him so truly of the wicked murders he had done that he himself seized an arrow and shot it into the heart of Ursula. And thus it was that Ursula came into heaven last of all that shining host who had gone across the world at her bidding with the message of Christ's love.

ST. CATHERINE, THE GIRL WHO DEFIED AN EMPEROR

A COMMON sight at a celebration such as Independence Day is the Catherine-wheel. It is a wheel made up of a wooden hoop with sticks for spokes, and little rockets all round the rim. When it is fixed to a wall and lighted, the gunpowder inside the rockets takes fire and hisses and spouts sparks, and causes the wheel to revolve, so that it looks like a ring of brightly colored fire.

The Catherine-wheel gets its name from a saint who was bound to a wheel. It was St. Catherine of Alexandria. She was a Christian, and the cleverest girl in Egypt in her day. She lived in the fourth century, when most of the people about her were heathens. One day she heard that the emperor Maximinius had ordered many poor people to be slain as a sacrifice to the idols the emperor worshiped, and Catherine went to his palace and condemned his cruelty and stupidity.

It was in vain that he tried to argue with her. She was too clever for him, and what she said was too just and right to be affected by anything that he could urge. So the emperor sent for all his wise men to argue with her. They were as helpless as he had been. She defeated them all in a great debate, and many people became Christians on hearing her wonderful words. This made the emperor angry, and he ordered that she should be put to death—tortured to death on a wheel.

What this wheel was like we do not now exactly know. One account says that it was shaped like an ordinary wheel, but armed with spikes, which hurt her at every movement. Another account says that it was not one wheel, but four wheels joined, armed with teeth. Whatever the nature of the wheel, poor Catherine was bound to it. But a wonderful thing happened. No sooner had she been tied to the wheel than an angel appeared—so the story in the old books runs. The angel loosed her bonds and set her free. He broke the wheel in pieces; he killed the man who had invented it, and destroyed also several of the cruel people who had gone to see the brave girl tortured. Those who escaped ran away, crying, "Great is the God of the Christians! He doeth wondrously both in the heavens above and in the earth beneath."

But the wicked emperor was not content. He had Catherine beaten with scourges, and caused her to be cast into a dark dungeon and kept without food for twelve days. But in her sorrow there came to her comforting visions and healing for her wounds, and the stories say that a dove brought her food.

At the end of the twelve days the emperor had Catherine led forth, and ordered his executioner to strike off her head with a sword, and so at last she died.

That is the story which the old books tell. We need not believe it all as having happened exactly like this. People did not then write history at the time that events were happening. For years and years a story would be told by word of mouth, and, by the time that it first came to be written, exaggerations and mistakes would have crept in.

But it is certain that St. Catherine was tortured on a cruel wheel, and that she escaped from it with her life. Many chapels were dedicated to her. The pictures of her show the wheel as her symbol, with sometimes a crown and a book, as well. She came to be looked upon as the patron saint of wheelwrights and mechanics, an inspiration to preachers, and a special guide for nuns.

ST. CATHERINE BOUND TO A WHEEL

Catherine of Alexandria rebuked the emperor for his cruelty to Christians. He ordered Catherine to be put to death, and she was bound to a wheel armed with spikes. Delivered by Heaven from this torture, she was thrown into a dungeon. At the end of twelve days the emperor ordered her to be beheaded. This picture of her rescue from the wheel is from a painting in Milan, made by Gaudenzio Ferrari.

ST. BENEDICT, THE BOY WHO FLED FROM ROME

MANY years ago there was a wealthy family in Italy, and the only son was the pet of the house, on account of his pleasant, cheerful manners and the brightness of his understanding. His parents wished him to become a judge, and while he was yet a youth they sent him into the great and mighty city of Rome to study law. But the boy, whose name was Benedict, found Rome a dreadful and a wicked place; he was shocked by the luxury that met his eyes, and by the light, flippant, and very often evil conversation which reached his ears. Instead of thinking about the law, he thought about this wickedness, and wondered what God must think of the city of Rome. So greatly was he shocked by the wickedness of the city that he ran away from it, and hid himself in the hills, determined to serve God in silent loneliness. But his old nurse, who loved him dearly, followed Benedict, and waited upon him with tender care. For a long time he lived in this manner, until it seemed to him wrong that he should let this old woman fetch him food, and once more he ran away. This time he traveled far into the mountains, and lived in a wild and savage cave. He did not escape temptations in this lonely life, and once he was so frightfully tempted to return to Rome that he flung himself naked into a thorn-bush and rolled in it till the pain had driven all evil thoughts out of his mind.

Many years ago the son of a wealthy family in Italy ran away from Rome, frightened by its terrible wickedness, and became a hermit. A small company of men followed him to the mountains, where they lived pure lives, seeking only the glory of God. In many parts of the world to-day men still live as followers of St. Benedict. This portrait of him is by Memling, a great Flemish painter of Columbus' time.

Many years passed, and people heard of the holy man living alone in a cave and thinking only of God. They came and visited him. A company of monks were so impressed by his preaching that they asked him to come and rule over them, and this he consented to do. But Benedict found that the monks lived too easily, and he introduced a greater sternness into their lives. Then the monks repented that they had ever asked him to be their superior, and, we are told, poisoned some wine and presented it to Benedict. But Benedict was warned, and he made the sign of the Cross over the wine, and the cup fell to the ground and was shivered into fragments. Then Benedict returned to his cave, and many holy men came to live near him; and he built houses for them to live in. These monks had to desire three things—poverty, purity and obedience—and they had to agree to work several hours every day with their hands. St. Benedict caught a fatal fever in nursing the poor, and while he was dying he bade his followers bear him into the chapel, where he died before the altar.

ST. NICHOLAS, THE REAL SANTA CLAUS

A RICH young man was walking one day through the streets of his native town, when he heard sounds of lamentation from the house of a nobly born man whose money had all been lost and who was now living on the verge of starvation with his three daughters. The young man listened, and he heard a girl's voice say:

"Father, let us go into the streets and beg, for it is hard to starve."

Then he heard the proud father make answer:

"Not yet. Not to-night. Let us wait one more night. I will again pray God to save my children from such disgrace."

Nicholas hurried home. Among the treasures he had inherited from his father were three bars of solid gold. He took one of these bars at night to the house of the poor man, and finding an open window, which he could just reach by standing on tiptoe, he thrust in the bar of gold and departed. Then he came a second night, and left the second bar; and the third night, and left the third bar. But the third night he was discovered, and the poor father, who believed that the gold had come from heaven, knelt at his feet. Nicholas lifted him up, and said:

"Give thanks to God, for it was He who sent me to you."

This and many another splendid gift of love did Nicholas make in the name of God and always in secret, so that he is called St. Nicholas, and we say that he comes to children on Christmas Eve and fills their stockings with gifts for the sake of his Master, the Lover of all children and the Savior of mankind.

ST. AGATHA, THE BRAVE MARTYR-GIRL OF SICILY

QUINTIANUS, the governor of Sicily, was in love with a very beautiful Catanian girl named Agatha.

She was proudly bred, and of rich parentage; so that when she avoided him, and even ran away to a distant city, he thought it was her pride that governed her. But presently he discovered the truth. Agatha was a Christian.

The governor sent soldiers, and had her brought before him. For a long time he pleaded with her earnestly to give up her religion, but she remained faithful.

Then the love of Quintianus turned to a most hideous hatred. He had the beautiful girl, whose faith he could not shake, cast into a dungeon. Then she was stretched upon the rack, and the cords were tightened, till her bones started. But she clung to Christ, and would not be persuaded to deny her faith.

Then the merciless governor who had been her lover used the sword upon her, and she was thrown back into her prison terribly wounded. No doctor was allowed to see her, no nurse to tend her. But as she lay on the ground of her cell no cry or moan escaped her lips. Instead, a lovely smile of happiness overspread her face, and in a great peace she sighed out her soul to the Lord Jesus Christ.

Such was the faith of this girl. Like all the company of saints, she was so sure of Christ, so certain of Eternity, that no agony could affright her, no death could appall her.

ST. CRISPIN, THE PATRON SAINT OF SHOEMAKERS

THE patron saint of shoemakers is St. Crispin, and the reason is this.

In the third century there lived at Soissons, a small town of Gaul, two natives of Rome, two brothers, Crispin and Crispinian.

They were teachers of Christianity; but they thought it right to earn their own living, and this they did by the making of shoes. They charged money to the well-to-do, but for the very poor they made these shoes without charge of any kind.

Their fame spread, and many of the people in Gaul visited them, and learned from them the story of Christ's love. At last there came to Soissons the heathen emperor, and he commanded that these shoemakers should be arrested. They were tried, tortured dreadfully, and afterward beheaded.

Whenever you see the picture of a saint with the palm of victory in one hand, and in the other an awl, you may know it is either Crispin or Crispinian, the patron saints of shoemakers.

ST. CECILIA, THE SWEET SINGER OF ROME

THERE was a strange scene in the city of Rome one time, when it was a crime punishable by death to be a Christian. A handsome young Roman soldier, by name Valerian, had just brought home his bride, a very beautiful and proudly bred Roman girl, named Cecilia. The festivities were over. The guests had all gone. Valerian was alone with his bride. Then Cecilia said to him:

"I am your wife, but I do not belong to you. I belong to Christ. All my life long I have given myself to Christ, and I have a guardian angel who will protect me from evil."

Valerian was much surprised, for he had no idea that the noble parents of Cecilia were among the despised Christians.

"Show me this angel," he said to his wife; "then I shall know if what you say is true."

She told him that he could not see the angel until he had learned to love Christ, and bade him go along the Appian Way, outside the city walls of Rome, and ask the poor people who lived there to direct him to Urban the Good. This Valerian did, and he found Urban living underground in the catacombs. Urban told him the story of the Fatherhood of God and the Sonship of Jesus Christ, and Valerian believed and was baptized. So happy was he in his new faith that he persuaded his brother also, and these two, with the beautiful Cecilia, spent their lives in doing good to the poor. The home was very happy, for Cecilia had a lovely voice. She sang songs to God which thrilled the hearts of the two brothers, and they knew that after death they would all meet in a happier world.

St. Cecilia, whom this picture by Van Eyck shows playing on the organ, became a Christian in the great days of Rome, when Christianity was despised. She and her husband, a handsome young Roman soldier, spent their lives in doing good. Condemned, she died a terrible death, singing to the end, in spite of suffering.

Soon it became known that Valerian and his brother were Christians, and they were put to death. But Cecilia became bolder in preaching, and was brought before the governor.

"What sort of woman are you?" he asked roughly. "And what is your name?"

"I am a Roman lady," she replied proudly. "Among men I am known as Cecilia, but my name is Christian."

Then she was condemned, and they carried her away to her own house, and placed her in a bath of boiling water. She was then bound, and a sword descended upon her neck, but did not sever it. For three days she lived, giving all her money to the poor, and singing praises to God; then she died, and ever after was called St. Cecilia.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 2127.

A quaint picture of the game of Bat and Ball, from a fourteenth-century manuscript.

BRITAIN'S ART BEGINS

CONTINUED FROM 1883

IN the realm of art England's place is not at all proportionate to her wealth and might. A very distinct place she has in that realm, but it has nothing to do with her empire of world-greatness; it centres in the little island of Britain. Painting for its own sake—the making of pictures out of pure love of beauty of line and color arrangement—has not come naturally to the British people. Their love of beauty has found its fullest and most glorious expression in words, in exquisite poetry and noble prose. Lacking creative power in painting, they have either pictured scenes that might have been put into words—illustrative pictures—or have followed the models provided by nature, reaching the highest success in the fields of portrait and landscape painting.

England had her earliest lessons in painting in about the fifth century, from Ireland. And until the fifteenth century the monasteries were the schoolrooms and art workshops of England and Scotland.

The Irish monks had a rare and peculiar genius for the illumination of manuscripts—the earliest art of the British Isles—and they set the Scottish and English monks working in their way. The Book of Kells is the outstanding work of Irish genius. Among others produced under their influence is the famous Lindisfarne manuscript, now in the British Museum. After a time the English illuminators developed characteristics of their own. From about the tenth to the fifteenth centuries their work was more important than any other of its class throughout Europe.

During this period came the greatest disaster that ever happened to mediæval art and letters in England—the Black Death. The population of the country at that time, 1348, was between four and five millions—about two-thirds the size of London to-day—and of these about one-half died during the plague. For a long time the usual routine of life was broken, the habit of work destroyed, and in the years of the plague rare and beautiful manuscripts were lost.

The Black Death did not kill English art, but put back its development. Worse results came from political troubles—the Wars of the Roses and the breaking-up of the monasteries. Later came the Puritan rebellion, during which many valuable pieces of work were destroyed because men thought they savored of the "Old Religion."

Before the sixteenth century dawned the real and beautiful English art of the earlier days had died, and for over two hundred years genius, though not really dead, was sleeping. The only active expression it had was the work of miniature-painters, who had inherited the beautiful skill of the illuminators.

HOLBEIN, WHO PAINTED THE FIRST FINE PORTRAITS IN ENGLAND

Just a few pictures have been left of the confused years before Holbein, from Augsburg, painted in England. The famous portrait of Margaret Beaufort, by an unknown painter, is one of them. Another is the picture of Richard the Second and Saints, at Wilton House, and there is the remarkable picture of the same monarch at Westminster.

Holbein arrived in England about 1526 and became court painter some ten years later, as you may see on page 1345. There are many portraits of English people in various collections which were, without any doubt, done under his influence. A great deal of poor work has been kept, but, apart from Holbein's, very little good. A portrait of Edmund Butts, by John Bettes, in the National Gallery, is one of the few pictures of merit.

EARLY WORK OF DISTINCTION DONE IN MINIATURE

After the work of the monks came to an end there was for a time no good miniature-painting in England, until Holbein by his example set the artists going again. Holbein's portrait miniatures were very fine indeed. Hilliard, one of Holbein's followers, painted some tiny portraits of great delicacy and charm. After Hilliard came the Olivers, father and son. A wonderful full-length miniature portrait of the Earl of Dorset, by Isaac Oliver, is treasured in the South Kensington Museum. In it can be seen how marvelously dainty is the effect, at the same time how rich and strong is the drawing and color of this gifted maker of little pictures. Another fine piece of work is the portrait of Sir Philip Sidney, at Windsor Castle.

Hilliard and the Olivers painted in the style Holbein had brought to England. Afterward came Cooper, whose manner was more like Van Dyck's, of which you are told on page 1586. Most of Cooper's pictures are in private collections. These men were the first great masters of the British miniature school, and they had much influence on the artists who followed them. They kept throughout their work a fine quality which promised distinction yet to come in British art.

The generations between the death of Holbein in London, in 1543, and Van Dyck's settling there, in 1632, are linked together in a slender way by the names of artists such as George Gower, sergeant-painter to Queen Elizabeth, Sir Nathaniel Bacon, a nephew of the great philosopher Francis Bacon, and Cornelius Jonson. Most of their work is preserved in private collections.

VAN DYCK OF ANTWERP FOUNDS A STYLE IN ENGLAND

When Van Dyck became artist to the court and aristocracy of Charles I he not only set the fashion in a kind of painting that was very different from the style Holbein had brought to England, but established a school in which can be faintly seen the beginnings of a national art. His best pupils were still, for a time, foreigners. Among the other men who worked with Van Dyck and were influenced by him were William Dobson, "Old" Stone, Lely, and Jameson the Scotsman. Dobson's best portrait is that of Endymion Porter, in the National Portrait Gallery, London. There are many of Jameson's pictures in various collections in Scotland. He was sometimes called the Scottish Van Dyck. But of all the men who fell under the influence of Van Dyck's genius the most important is Sir Peter Lely, as it is through him, although he came from Westphalia, we can trace the line of descent, so to speak, of truly English qualities in art.

He became painter to Charles II, and his pictures reflect the lightness and artificiality of the Restoration. He was not a great artist, for he lacked strength, as we can see in even his most famous pictures. But he kept a certain quality that makes his work interesting from the point of view of history.

Kneller, a German who followed Lely, was weaker still, and he was worse than weak: he was false. He cared nothing about good work, and only posed his sitters in an attractive way and made them look beautiful. Unfortunately, Kneller became a society darling. It was the fashion to be painted by him, and he imposed his style on a whole generation.

David Playing the Harp, from a Saxon psalter of a thousand years ago.

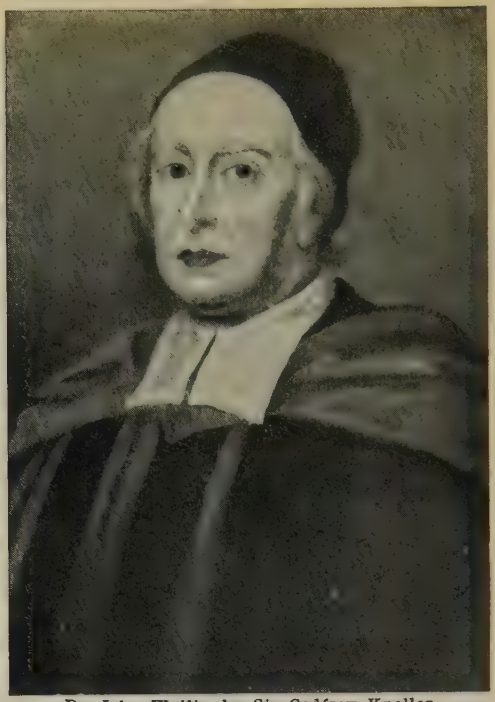
An initial letter, from an 11th century book.

An illuminated manuscript of the 14th century.

The Virgin, from a 12th century psalter.

PORTRAITS BY KNELLER AND LELY

Sarah Jennings, by Sir Godfrey Kneller.



Dr. John Wallis, by Sir Godfrey Kneller.

Kneller's Portrait of Marlborough.

Mary Davis, by Sir Peter Lely.

The photographs of these pictures are by Hanfstaengl, Emery Walker and others.

The Duchess of Cleveland, by Sir Peter Lely.

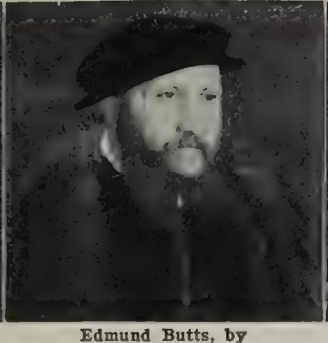
John Gay, by Sir Godfrey Kneller.

Lely's famous portrait of Nell Gwyn.

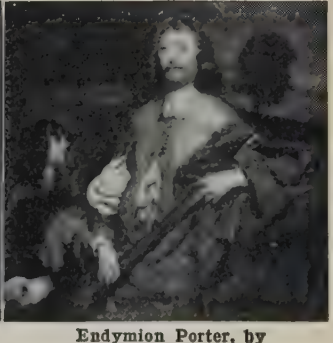
The Earl of Essex, by Isaac Oliver.

Comtesse de Grammont, by Lely.

Sir John Coke, by Cornelius Jonson.



Edmund Butts, by John Bettes.



Endymion Porter, by William Dobson.

No man could be successful unless he painted in Kneller's way.

ENGLAND'S LITERATURE, A GLORY GREATER THAN HER ART

These were truly dark days, as far as painting goes. We have to take long views over the past and follow the story of national development in order to understand the English genius. English art in the reign of Elizabeth was like a baby coming to the foot, as the old nurses say, walking uncertainly in leading strings; but the literature of England was one of the wonders of the world. Imagination, sense of loveliness, feeling for the divine in a human world, all that the old limners had put into their manuscripts was expressed in these centuries in poetry. The genius of the nation ran clearly in that one crystal stream.

There has been no landscape painted in England yet to equal twenty lovely lines from Shakespeare's pen. No English artist has conceived a picture of the coming-on of old age that stirs something in the soul as do certain verses by George Peele, or a picture of radiant youth half as lovely as one of Thomas Campion's poems. And when English art came at last into its kingdom, it gloried in pictures of English people and English green fields.

At the beginning of the eighteenth century the art of England had become degraded into something weak and false. All that Kneller and his fellow-artists cared about was to paint portraits which should flatter the sitters. The style Van Dyck introduced had not lived two generations after his death, the fine distinction of his work having been lost in poor imitations. On the walls of people's houses hung paintings of simpering ladies and posing gentlemen in elegant garments.

HOGARTH OPENS A NEW DOOR IN ENGLISH PAINTING

Hogarth was the man who saved English art. He came on the scene so astonishingly at the right moment that his existence seems as much of a miracle as his genius. He lived from 1697 to 1764, and you will find a story of his life on page 2327.

Hogarth tells us that when he was a child, shows of all sorts gave him extraordinary pleasure, and that he loved mimicking. "My exercises when at school," he says, "were more remarkable for the ornaments which adorned them than for the exercise itself." Because of his bent for drawing he was apprenticed to an engraver. Even after he had painted a number of pictures, his engravings were better understood and liked than his paintings and had a better market. His paintings themselves, in their fine and careful finish, showed the effects of his skill as an engraver.

It is easy to see that England at that time had no native tradition in art to limit or hamper a man who had original ideas. That page of history was still blank; so Hogarth, while he did not meet with prompt understanding or approval when he began to set a new fashion in painting, had less to work against than would an artist belonging to a country with a long art history or a settled school of painting.

A TIME OF FRESH INTEREST IN STORY-TELLING ARTS

In the England of his day men were very much interested in the stage and its drama. In the way of literature, too, a new kind of writing was being produced, to meet the needs of others besides the learned and the great. The middle classes, coming into independence and importance, were deepening the tone of common sense in life, and were claiming more attention. Stories of real life which they could appreciate and enjoy took the place of formal poetry and dignified prose. Indeed, Hogarth was but a young man when Robinson Crusoe, the first novel giving details of real life, was published and received with great enthusiasm by a multitude of eager readers.

In Hogarth's pictures the feeling for drama and story-telling is so strong that his position as a truly great painter has sometimes been lost sight of. Among other influences of the time, the stern attitude of Puritan morality is reflected on his plates and canvases. He not only tells a story, but it is a story with a moral, pointing out some evil or folly of the days in which he lived. He was painter, dramatist, satirist and preacher all in one. He wrote of himself: "I have endeavoured to treat my subjects as a dramatic writer; my picture is my stage; my men and women my players, who, by means of certain actions and gestures, are to exhibit a dumb show."

The men and women in his "dumb show" were actual men and women of his London, for he was well acquainted with the city and its people. He was a keen

observer and had a lively sense of the absurd in a situation; in other words, he was born with the faculties of a satirist. Put with these faculties an instinct to express himself as a painter—an artist in pigment.

For Hogarth had such control of his brush; such natural taste in arrangement, light and setting; such charm of color; such a sense of values, that Whistler has spoken of him as the only *great* English painter. He is now recognized as the father of all modern realism in painting.

Pulling aside the curtain of sentimental pretense, he showed on his stage a sturdy representation of things that were wrong, with a healthy hope of getting rid of the wrong and bringing about better conditions. Middle-class, lower-class and upper-class life were set forth in his picture dramas or novels—people who wore rags and lived in garrets, and people who dressed in silks and dwelt in mansions. Each of his separate "Conversation" pictures gives a whole story in one scene. For instance, in a picture called The Enraged Musician an old music-master, his hands over his ears, is bending from an open window scolding furiously at the noise-makers in the street outside—a knife-grinder, a ballad-singer, a milkmaid, a boy with a drum, children at play, and other folk contributing to the distracting din which we can almost hear as we look at the picture.

Then there are whole series of tableaux, the most famous of which is Marriage à la Mode. This in six paintings presents a tale of a loveless marriage, the bride's father, who has money, having arranged the match with the groom's father, who has social rank. We can read the story in these paintings as plainly as if it had been told in words. Marriage à la Mode is in the National Gallery, London, and another famous series, The Rake's Progress, is in the Soane Museum.

You will think of Hogarth's pictures as genre works; and so they are, of a sort, but very different from the Dutch genre painting, where the artist was interested in a scene, not because it would tell a story, but because it had pictorial value in itself.

Hogarth, then, had originated a new idea in painting; but he was a painter of portraits, too, some of which stand very high in rank as works of art. Look at the portrait of himself with his dog Trump and his palette on which he had drawn the double-curved "line of beauty." It is just above, on this very page. There you see him as he was—a little man, not unkind, but combative and more than a little stubborn. Because he chose not to copy foreign painters but to work out his own way, and because he stormed against picture-dealers for selling poor copies of great masters, made by inferior artists, he was accused of criticizing the masters themselves. To one of his friends he explained: "The connoisseurs and I are at war, you know; and because I hate *them,* they think I hate *Titian*—and let them!"

Portraits by Hogarth—Polly Peachum, The Artist and His Dog, and The Artist's Sister.

THE NEXT STORY OF THE FINE ARTS IS ON PAGE 2077.

THE LAST HEROISM OF SIR PHILIP SIDNEY

Sir Philip Sidney lay on the field of battle in great pain and in a raging fever. He called for a cup of water, and with great trouble water was brought to him. He was about to drink it when his eye caught the gaze of a wounded comrade dying of thirst. Sir Philip Sidney stretched out his arm and gave the water to the dying man, saying: "Soldier, thy need is greater than mine."

WHAT THESE STORIES TELL US

FOREMOST among English heroes is the great Sir Philip Sidney, who, when dying of thirst, gave his cup of water to a wounded soldier beside him. Many times the battlefield has brought out pure heroism such as this. We read, too, of the heroic life of a doctor in Ireland, reminding us that we owe to our doctors a debt that we can never pay. A sister's devotion to her brother, a doctor's devotion to his patients, a mother's devotion to her children—all these are examples of true heroism; and they are all stories taken from real life.

THREE CUPS OF COLD WATER

CONTINUED FROM 1733

THERE is a saying of Jesus which has woven itself into all the history of humanity, into the periods of famine, the days of battle, and the hours of death. It is the saying that we do Christ service even when we give only a cup of cold water to those who thirst. "For whosoever shall give you a cup of water to drink in my name, because ye belong to Christ, verily I say unto you, he shall not lose his reward."

The brave English soldier Sir Philip Sidney lived at Penshurst, in Kent. He wrote tender poems under the noble oaks which you may still see spreading their wide arms over Penshurst Park. He was one of those who have lived Christ's words.

Sir Philip Sidney was called by Queen Elizabeth the "jewel of her times." He was a great scholar and traveler, a poet and musician, an athlete and horseman—above everything else, a great gentleman. The nobility of his nature, the bravery of his spirit and the graciousness of his manner rendered him the most notable and romantic figure of his age.

In a great battle at a place called Zutphen Sir Philip Sidney was mortally wounded. He had fought like a hero. Two horses had been killed under him, and still he led his soldiers with a dauntless courage into the thick of the fight. But at last a bullet struck him, and as he reeled in the saddle his horse turned and bolted with him from the field.

When he was in the camp he called for a cup of water. The day was exceedingly hot; he was in a raging fever; the agony of his wound was indescribable.

With great trouble a little water was procured and brought to him. He lifted himself up, took the bottle, and was about to place it to his lips when his eye caught the gaze of a poor wounded soldier fixed upon the water.

The look in the man's eyes made Sidney forget his pain. With a noble smile he stretched out his arm, handed the bottle to the dying man, and exclaimed: "Soldier, thy need is greater than mine!"

Such was the glory of Sidney. The epitaph of one of his friends was in these words:

Fulke Greville,
Servant to Queen Elizabeth,
Counsellor to King James,
Friend to Sir Philip Sidney.

Another hero is famous for a somewhat similar deed. This is the generous Rudolf of Hapsburg, whose descendants long ruled over Austria, a kingdom made by his power. On one occasion Rudolf was with his army in a place where everyone was afflicted by terrible thirst. Somebody was able to find a cupful of water, which was brought to Rudolf as a great and priceless treasure. He took the prized cup in his hands and exclaimed: "I cannot drink alone. All cannot share this little draft. I thirst not for myself, but for my whole army." And so saying, he emptied the water upon the ground.

One more we may include under our title of "Cups of Cold Water," because it shows the Christlike spirit, although in a new and startling manner.

During the seventeenth-century wars between Denmark and Sweden, a wounded Dane was about to raise a wooden bottle of water to his lips when a cry reached him from a wounded Swede stretched on the ground at a little distance.

The good Dane, using the words of Sir Philip Sidney, stumbled to the side of his enemy, and saying, "Thy need is greater than mine," kneeled down and offered the water to his lips. But the Swede, suddenly raising a pistol, fired, and wounded the Dane in the shoulder.

"Rascal!" cried the twice-wounded soldier of Denmark. "I would have befriended you, and you would murder me in return! Now I will punish you. I would have given you the whole bottle, but now you shall have only half."

He then raised the bottle to his lips, drank of it, and afterward gave it into the hand that had attempted to kill him.

THE DOCTOR OF BURTON PORT

DOCTOR WILLIAM SMYTH lived in the northwest of Ireland at Burton Port, a little coast village in county Donegal, twenty miles from a railway, in the midst of poor fisher-folk whom he attended for small fees. Four miles from the mainland was the island of Inishmore, where a few families managed to exist by fishing.

In the end of the year 1901 an epidemic broke out in the island. Dr. Smyth rowed over the four miles of rough sea daily, taking with him such things as the sick folk needed. They lived in squalid hovels, and he had to be doctor and nurse too, for there was no one else to help.

At last he decided that to save the people he must bring them to the mainland, to have better care and nursing. But the fishermen of Burton Port feared to lend their boats, lest they should carry the fever, and only one leaky vessel could be found. An officer of the local government board came to the doctor's aid, and together they rowed over to the island, carried the poor sufferers one by one into the boat, and set off for Burton Port. The crowded boat proved to be more leaky than the doctor had thought, and they were barely able to bring the last patient ashore before it began to sink. All the way over the doctor had rowed the heavy craft alone, while the officer baled the water out, and he was so exhausted that when the work was done, he went home to bed. While he was caring for the poor people the fever attacked him; he had no strength left to resist it, and in a week he died. He had saved many lives, but in so doing had sacrificed his own.

THE SACRIFICE OF A KING'S SISTER

THERE was trouble and confusion in Thebes. The two brothers who ruled the city had quarreled, and one brother, Eteocles, had driven out the other, Polyneices, that he might reign as king alone. But the brother who had been driven away gathered an army with all speed, and came back to attack the city. Eteocles and his soldiers marched out to meet him, and the brothers fought and killed each other. The besieging army, having lost its leader, turned and ran away.

The new king was Creon, the uncle of the brothers, and he issued an order that the body of Eteocles was to be buried with great honor and a splendid funeral procession, but that the body of the other brother was to be left lying on the plain outside the walls of Thebes with no funeral rites, no burial,—abandoned for the birds to devour.

It was thought a terrible thing in those days to leave a body unburied, so Antigone, the sister of Polyneices, determined to bury her brother, though the king said that anyone who buried or honored the body should be shut up in a rock tomb and left there to die.

Antigone went secretly from the city, and as she could not carry the body, she scattered dust over it to honor it, thus taking away all the disgrace. The king ordered her to be buried alive in the rock tomb. As they led her away, all who saw her were moved to tears. Even the king repented of what he had done, and sent to fetch her from the tomb. But his messengers arrived too late. Antigone was dead.

MARIE ANTOINETTE'S GREAT SACRIFICE

THE king of France had been torn from the arms of his wife and children by the Revolutionaries. He had been driven through the crowded streets of Paris in a tumbril, the drums rolling, the soldiers armed—he had ascended the scaffold; the executioners standing there had seized him brutally, thrown him down under the knife, so carelessly that the falling blade had mangled him; and then, the drums rolling louder than ever, people shouting from the streets, the windows and the housetops, the head of the king had been held up to the public gaze, and France was kingless.

In the great prison of Paris was a shivering group—Queen Marie Antoinette, her two children and a sister of the dead king. The children clung to their mother. The king's sister looked at the widowed queen through tears. What would come next? Would the people of France rest satisfied with the death of King Louis? Or would they say, "His queen still lives, and his son, the son who is called by foreign nations king of France"?

The days went by slowly in the great prison. Discipline was a little relaxed. Friends of the queen were allowed to see her. Some of these friends were men of action. They knew the peril of Marie Antoinette. They knew also their own peril in being her friends. But they were brave men—all except one. The thought of this beautiful woman bowed under the dreadful knife of the guillotine was horrible to their souls. They determined to save her, the coward less earnestly than the others.

Now, in those days there was one spirit abroad more terrible than all the rest—the spirit of suspicion. France had got rid of her king; she was now a masterless republic; and no man could trust his neighbor. Panic took hold of the people of Paris. At a whisper that a man was sorry for the king's death away went that man to the guillotine. Blood ran all day in the square called Place de la Révolution. Husbands were torn from their wives, sons from their mothers; no man was safe. It was the Reign of Terror.

And yet in this state of universal terror the friends of Marie Antoinette (the coward among them) set themselves to rescue that unhappy queen from her prison.

It was a bold, a noble, an utterly fine thing; such men deserve the homage of mankind, and we can find excuses for the coward. It matters not whether Marie Antoinette was worthy of such devotion; the thing that counts is the devotion of those friends.

They could not bear that she should die horribly in the public streets; to prevent it they would run the risk of themselves being torn to pieces.

So they laid their plans, and one day they came to the queen and unfolded the plan for the rescue of herself and her children. Then the coward began to have misgivings. The queen strove to encourage him. He was a professor; he pointed out reasons for delay. His arguments were the very soul of logic. None who heard them could confute them. They were sound arguments. But there is that which undoes the most skillfully woven logic in the world—the tick of the

clock. The professor argued; the clock ticked. The opportunity for rescue passed.

Foreign nations had declared war against France. Danton, one of the uncrowned masters of this new commonwealth, made answer: "The kings of the earth come up against us; we fling at their feet, as a gage of battle, the head of a king."

France was in arms. The nation rose to defend itself.

"What of the queen and her children?" asked the men of the Terror. The guards set in charge of Marie Antoinette were increased. Escape was impossible.

But without the professor the others went on. The danger to Marie Antoinette had become greater now, far greater. The people were crying out for her blood.

"It is this Austrian woman that has brought war upon us!" they cried. "Down with the Austrian woman!"

Her friends said to each other: "It is now or never!"

To save queen and children was out of all question. To save queen alone was possible. The plans were made ready. The risk was looked boldly in the face.

Then came the brave conspirators to the queen, and the proposal was made to her. She looked at them, not comprehending.

"Leave my children!" Haughtiness and defiance mingled in the mother's face as she regarded her friends. "It is impossible!"

But Madame Elizabeth, the sister of the dead king, spoke earnestly to the queen that night. "You are the only one threatened. For the sake of your children you should go. One day your son will be king of France; will he not need a mother at his side? And while you are in hiding till this tyranny be overpast, I, their aunt, will be a mother to your children. It is not for your own sake you should flee: it is for theirs."

Marie Antoinette listened and decided. "It is well said; I will go."

That night the queen sat with her sister-in-law on the edge of the prince's bed. The boy was asleep. The mother looked at her child's flushed face laid upon the pillow.

Her daughter lay in a room adjoining, sleepless, the door open. The princess, lying there between slumber and waking, heard the voices of the royal ladies.

"God grant," said the queen, looking down at her son, "that this child may one day be happy!"

"Be assured, dear sister, that he will."

"Youth flies away, even as joy," said the queen. "There is nothing in life that lasts. Happiness has an end."

She got up from the bed and began pacing the room. The little princess could hear the steps of her mother.

"And, you, dear sister," said the queen, "when and where shall I ever see you again?" She paused. "No! No!" she cried. "It is impossible! It is impossible!"

That cry was the sacrifice of Marie Antoinette.

It meant, not that escape was impossible, but that to desert her children was impossible. The mother rose triumphant in her heart. Beyond the walls of the prison, beckoning to her and calling to her with songs, was liberty and freedom from terror. Here, on these guarded walls, deepened and darkened with every shifting of the hand of the clock, was the shadow of death.

As the allied armies advanced against the frontiers, the trial and condemnation of Marie Antoinette became a certainty. She was separated from her children and at last put on trial. She was accused and found guilty of having helped the enemies of France and of having tried to stir up civil war within the republic. After two days she was led out to die, leaving behind her a touching letter to Madame Elizabeth, known as her "Testament."

So this poor queen, who had left her home, weeping and terrified, as a child of fifteen to become a wife in a strange land, who had been weak and foolish and had lived the vain existence of those about her—this poor weak queen, brought to decide between her own liberty and the desertion of her children, laid down her liberty, and went to the guillotine for the sake of her children. In this one act she was noble. Perhaps all through her life she might have been noble, too, if the call to her higher self had been as loud, clear and certain as it was at that hour. All through the harrowing hours of her trial she kept a calm dignity and a steady mind—a queen to the end.

THE NEXT STORY OF GOLDEN DEEDS IS ON PAGE 2319.

HORSES FOR WORK AND PLEASURE

Standard- or Trotting-bred stallion, "Arion Guy."

Hackney Pony stallion (Irvington model).

Belgian Draft Horse, "Half Stock."

Clydesdale Draft Horse.

Shetland Pony stallion, "Silver Tip I."

Welch Pony stallion, "My Lord Penbrook."

Pictures from photographs by Haas, New York.

RUNNERS, JUMPERS AND TROTTERS

Kentucky saddle mare, Three-gaited type, "Golden Fire-fly."

Hackney stallion, "Seaton Seaton."

Kentucky Five-gaited stallion, "Kentucky's Choice."

Thoroughbred stallion, "Man o' War."

Lightweight hunter or jumper, Thoroughbred type, "Dansant."

Pure Arabian Saddle type, imported, "Sharabi."

Pictures from photographs by Haas, New York.

Horses in the Harvest Field—From the painting by Maud Hogarth Clay.

THE HORSE FAMILY

CONTINUED FROM 1831

EVERYONE loves a horse and admires him in action. Whether he is an Arab or thoroughbred, eager for the race, a great Percheron or Clydesdale, throwing his weight against the collar as he hauls a heavy load or draws a plow through the fresh earth, or a child's pony, as proud of his pretty trappings as his little rider, every line of a horse's body shows that he is built for strength and power.

Next to the dog, the horse is the most faithful and intelligent four-footed friend we have, and we have none that has given us truer service or can show greater devotion to his owner. Even among the nations that despise the dog as unclean the horse is loved for his faithfulness and intelligence, and a tired and hungry rider will always see that his patient horse is cared for before he attends to his own wants.

Scholars have taken special pains to trace back the history of the horse. Their search has carried them far back, beyond even the picture records of the cave-men, among the fossils of animals that had died out even before the cave-men lived, and they are able to tell us more about the horse than about any other animal in the world. It is a very interesting story that they have to tell, and it is all the more interesting to us because it is believed that the early development of the horse began on our own continent. Fossil skeletons have been found in Wyoming and New Mexico which tell his life-story from very early times. Before we go any farther we must remember that all the members of the Horse Family are distinguished from other animals by their teeth and their feet.

The teeth of the horse and other members of his family are made of three substances: dentine, such as all teeth are made of, cement, and a very hard kind of enamel. As you know, the horse lives chiefly on grass and grain, but his teeth are so made that he can grind this hard food into very small fragments. With constant grinding, the teeth wear down, but they do not become blunt, for the cement and dentine wear away more quickly than the hard enamel, which projects just a little above the rest of the tooth and is always sharp enough to grind. The teeth are formed a very long way within the bones of the jaws. As they wear away they push upward and downward, and the bone of the jaw grows inward to fill the hollow spaces left behind. By this wise provision of nature the horse is able constantly to

renew its tooth surface until it has reached a very old age as horse ages go. The teeth have a peculiar form, and from this we are able to say that the elephant, the rhinoceros and the little hyrax, about which you may read on page 2139, are very distant relatives of the Horse Family.

Now we come to the peculiarity in the feet, which is a distinguishing mark of the Horse Family. You know that most of the animals walk on their toes, and the peculiar thing about the Horse Family is that its living members have only one toe left to walk on.

The horse's ancestry is traced by his toes

Much study has been given to the history of the horse as shown by the fossils in the rocks. This is the story as worked out by the scientists. They think that the early ancestors of the horse had five toes, but from the beginning the horse had to save his life from his enemies by speed. Like all fast runners, he ran on the tips of his toes, which became very strong. Gradually, however, he threw all his weight on the centre toe. With succeeding generations it became stronger and longer; the other toes were used less and less and became weaker, and in time they ceased to grow at all. Now, if you will look at the picture of the horse on page 2016, you will notice joints marked "knee," "hock" and "fetlock." They look as if they were in the legs, but really they are part of the feet.

The knee and the hock are what correspond to our wrist and ankle joints, the fetlock is what was originally the upper joint of the toe. The nail has grown out into a thick hoof to protect the toe, and underneath it is provided with a soft cushion called the "frog," so that the heavy animal will not feel a jarring through his body when his weight is thrown on his toes as he gallops over the hard ground.

All this is true also of the donkeys and zebras, the other members of the Horse Family, which all have teeth and feet of the same kind. These distinctions have made it possible to trace the history of the horse back with scarcely a break. We can even say that the second and fourth toes were the last to be lost, and under the skin of the foot there are still to be found two small bones called splints, which are the last remnants of these toes.

Early ancestors of the horse lived in Wyoming

The earliest direct ancestor of the horse of which we really know anything lived many, many years ago in the forests of a plain that is now part of Wyoming. It was a slender little beast, only sixteen inches high, and had four toes on its front feet, but only three on its hind feet. This little horse has been given the pretty name of the Eohippus, or "dawn horse." It was descended, students think, from an animal with five toes on each foot, but no fossils of these earlier five-toed ancestors have yet been found.

The world in those days was a very different place from what it is now. The climate was much warmer and moister; there were seas in some places where now there is dry land, and land where now there are seas. North America was probably joined to Asia in the region of Bering Strait, and there was no sea between Arabia and Africa. It is important to remember this, or we shall wonder how horses found their way to the Old World, part of which is really younger than the New World in which we live.

The horse wanders over most of the world

Even before the time that the Eohippus lived, some of its ancestors had wandered across Asia into Europe. Part of the skeleton of a near relative of the Eohippus has been found in Great Britain, but all the members of this part of the family died out, or perhaps were killed by beasts of prey. Later on Great Britain became an island, and no horses reached it until they were brought by man.

The little Eohippus, too, had many enemies—strange, fearsome, dragon-like beasts still lurked in the forests, and there were fierce four-footed animals for which it made a sweet morsel. Only the strongest, most intelligent and swiftest of the little horses could escape from their foes.

Years passed. The old enemies of the horse died out, and new ones appeared. Still it steadily grew larger and stronger, and more like the horses we know. First it lost the fourth toe on the front foot, and we speak of it as the three-toed horse. Next the centre toe became so long that the other toes hung helpless on each side, and at last these helpless toes disappeared. Different names have been

given to it by scholars in the different stages of its life, but we shall not ask you to remember any more.

Meantime the world had been changing. Mountains like the Alps and Pyrenees grew up; the swamps dried; and there was a great deal of high, dry ground where before there were only low forest-covered plains. The horse found that by keeping to the high, dry ground he could escape his enemies of the swamps. He learned to feed on the coarse grass that began to cover the plains. His teeth changed so that he could grind it up, and as they grew longer his head became larger and stronger so that it could hold these enormous teeth. His feet and legs lengthened to give him speed, his neck grew longer so that he could reach down to crop the grass, and by degrees he became very much like the wild horses that have been brought from Asia to our zoos.

WHEN ALL THE HORSES IN AMERICA DIED OUT

By this time horses had spread, probably from America, over the high plains of Asia, Europe and the north of Africa. In America there were troops of horses of many kinds. And their fossils have been found from Alaska far down into South America. There were large horses and small ones, heavy horses and light ones. But before the beginning of the Ice Age something happened, no one knows what, and every horse on the continent of North America disappeared. The sea had destroyed the bridge of land that once stretched across the Bering Sea to Asia, so that none could cross, and there were never again any horses on this continent until the white man came. It was even thought that no horses had been native to the country, but recently their fossil remains have been found where they died, and from these their history has been told. Not long ago there were many wild horses in Australia, but these were descended from animals that escaped from the settlers. None of the early horses ever reached Australia.

As time went on horses became very numerous in the Old World, and the different branches of the family grew to be very much unlike each other. Scientists say that our modern horses are descended from at least two, and possibly four, stocks. Some of them were heavily built, with coarse necks, heavy heads, and the stiff upstanding manes that we call "hog manes." Most of these coarse, ugly horses lived in Central Asia and on the plains of Europe. Droves of these horses still exist on the central plains of Asia. Przvalski's horse, named from its discoverer, Nicholas Przvalski, is the type. In the forests of Europe some small horses lived, and the descendants of these horses are found, it is said, among the ponies of Norway and Ireland and the western Hebrides. Some think that they were simply a variety of the Asiatic horse, but others think they were a distinct stock. A third kind of horse had long, fine legs; a long, neat, well arched neck; large brain; large eyes; broad forehead; and a long, neat, pointed head. It is believed by men who have made a study of the subject that this horse developed in the north of Africa, and from it the famous Arab horses and the Barbary steeds are descended.

In later times, through the agency of man, all these families of horses became mixed. With careful breeding and selection many different types have developed, but they are all descended from the three families of which we speak. Our large, heavy cart horses are most like the coarse, heavy-headed, heavy-limbed horses of Asia; but the lovely Arabian horses, with their long, sweeping tail and silky mane, and our beautiful, intelligent, fiery thoroughbreds are descended chiefly from the slender-limbed, neat-headed African horse.

THE HORSE BECAME THE FRIEND AND SERVANT OF MAN

When man came into being, the horse gained a new enemy, and one who could fashion weapons with which to slay him and make traps to ensnare him. In one place in Europe, which was the haunt of early man, the bones of thousands of horses have been found. We know that our early ancestors found in the horse one of their chief sources of food, and from hunting him for food it was an easy step to tame a friendly animal like a horse.

We cannot tell who first used the horse as a beast of burden, or who, long after he was tamed, first learned to yoke him to a chariot. It is natural for man to love animals, and there were times perhaps when ancient man trapped a foal with its mother, and saved it for a pet and plaything for his children. Such a

pet, except in time of famine, would be spared, and so in time perhaps a race of tame horses grew up about the rude dwellings of our savage forefathers.

But it was long, long after this that the horse was put to use. The cave-dwellers who lived about fifteen thousand years ago made pictures of the hog-maned horse on pieces of bone and on the walls of their caves. Some people have thought that some of these pictures show traces of a primitive harness, but this is not likely. It is now thought that the Libyans, who lived in the north of Africa, were the first people who learned to use the horse. It is believed that these people trained the beautiful North African horses to draw chariots, and used them in battle against their enemies four thousand years ago or more. The Egyptians owned horses at an early date and used them in the same way as the Libyans. Indeed, it is believed that they got them from the Libyans. At about the same time the Assyrians began to use the horses that came from Asiatic steppes, but it is thought that they were trained, and brought down for the Assyrian armies by tribes who lived farther north. These people are thought to have been the first to learn to ride the horse, and this is all the more likely to be true because their descendants, the Turkomans and Mongols, have always been noted horsemen.

THE HORSE WAS FIRST IMPORTANT IN WAR

Once the horse had been trained for battle it was soon found that a nation that had no horses could not hope to stand against a nation that had them, and the use of chariots and of cavalry in warfare soon spread. The Egyptians do not seem to have known how to ride, but the Assyrians both rode and drove, and both these people have left us records of their horses on their pictured walls. These show that Egyptian horses were fine, like the Arabian horses, while the Assyrian horses had the heavy head and the short stiff mane of the Asiatic horse. The Greeks, who loved horses, had both kinds. Their poets sang about them, and their sculptors made some of the greatest sculptures of horses that have ever been known.

By the time of the Romans all the peoples of Europe had horses. Even in Britain Julius Cæsar found, to his cost, that the people had numbers of horses and chariots. How these horses reached Great Britain and Ireland is not known. They were probably taken across the Channel and the Irish Sea in open boats, just as the Norsemen afterward brought their horses to far-off Iceland.

The British horses spread northward through the islands. In the south they were quite large; but in the north, where living was hard, and fare poor, they became stunted, and their coats grew long and shaggy to protect them from the winter cold. In this way a new type of horse arose, and from them have come the dear shaggy little Shetland ponies that children love.

WHERE THE ARAB HORSES WERE FIRST FOUND

You will notice that all this time we have said little about Arab horses, and this is because there were none. There were wild donkeys in Arabia, but no horses, until they were brought over from Africa, less than two thousand years ago. They throve in Arabia, however, and when, centuries later, the Saracens set out from Mecca on their career of conquest, they had plenty of swift, strong horses, and were able to sweep everything before them.

They were superb creatures, intelligent, docile, high-couraged, with the speed of a hound and the endurance of a camel. The old Arab poets sang songs of their horses. Listen to this, the song of an Arabian poet who lived nearly fourteen hundred years ago, telling of the qualities of an Arab mare dear to his heart:

Spare is her head and lean, her ears pricked close together,
Her fetlock is a net, her forehead a lamp lighted,
Illumining the tribe; her neck curves like a palm branch,
Her withers sharp and clean. Upon her chest and throttle
An amulet hangs of gold. Her forelegs are twin lances.
Her hoofs fly forward faster ever than flies the whirlwind,
Her tail-bone borne aloft, yet the hairs sweep the gravel.

The Arabians tried to keep their beautiful horses to themselves, but in the seventeenth and eighteenth centuries a few were taken to England, and it is from these that the beautiful English thoroughbreds and hunters have come. Our thoroughbreds were originally de-

VARIOUS TYPES OF HORSES

Clydesdale Horse.

English Shire Horse.

Wild Ponies of the New Forest.

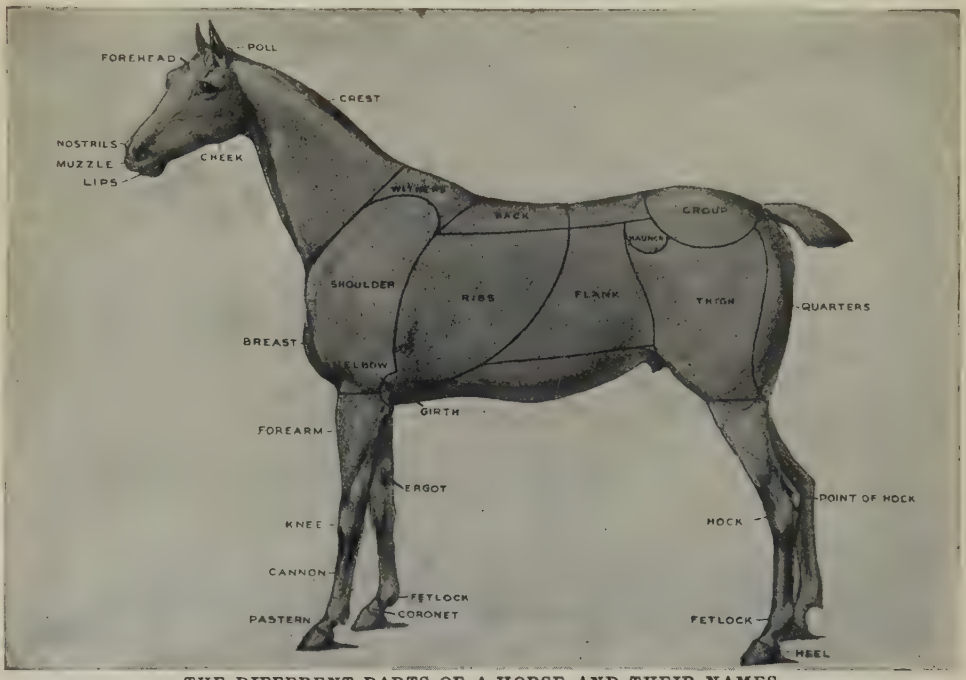
A horse worth $25,000.

A Hackney filly.

scended from the English thoroughbred, but lately some Arab horses have been brought to the country direct from Arabia.

How the powerful draft horses were developed

And now we must go back a little way to find out the origin of the powerful drayhorse. We owe the drayhorse to the agency of man, and originally he was not meant to be a drayhorse. In the days of chivalry, when knights rode to battle or in a tourney covered from head to foot in armor, it was no small steed that



THE DIFFERENT PARTS OF A HORSE AND THEIR NAMES

could carry them. So they began to breed more and more powerful horses, to carry mail-clad riders and their armor as well. In time of peace, or on a journey, the knights rode on small horses called palfreys; but when the hour of battle came they mounted their great war horses. Charging at a gallop, they met together with a mighty clash of lance on armor, and many a knight and horse went rolling on the field never to rise again.

When the wars were over, or when they were too old for battle, these heavy horses were used to draw the plow. When carriages first came into use they were very heavy, clumsy affairs, for which strong, heavy horses were needed. As better roads were made heavy drays and wagons came into use, and magnificent Clydesdales, Percherons and other powerful horses were used to draw them. These animals had enormous strength.

How the horse came back to America

Now, some reader asks, if all the American horses died out, how was it that when the West was settled the pioneers found that the Indians of the West had fine horses of which they were expert riders, and troops of beautiful wild horses roamed and galloped over the plains? They came by sea, and the Spaniards brought them. The knights and men at arms would not think of fighting on foot. The Spaniards knew they had much fighting before them, and they actually brought their horses over in their uncomfortable, inconvenient ships. Some of these horses escaped on both continents. They multiplied rapidly, and the troop of Indian ponies and mustangs that the pioneers found were their descendants.

From the names of the various kinds of horses we can tell pretty well where the different types have been developed. The Clydesdales, of course, came from

THE WILD HORSE AND THE DONKEY

Mongolian Wild Horse.

Grey's Quagga.

A donkey load in Portugal.

Grévy's Zebra.

Wild Ass of Somaliland.

Scotland, the Suffolk Punch and the Shire from England, the Percheron from France. Belgium is famous for heavy horses. Ireland has long been noted for fine hunters, and England for race horses. The Hackney is a showy harness horse which probably has some Arab blood. Apart from the descendants of the wild horses the horse that is most distinctively American is the trotter, a light horse that trots very rapidly. It is usually harnessed to a sulky or a light wagon, and covers the ground with amazing speed.

Some other members of the horse family

This is what we have done with the wild horse. The other branches of the family have not been so useful, because all the zebras are confined to Africa, where the natives have never had the instinct for domesticating animals. Repeated attempts have been made in modern times to domesticate the zebra, with varying success. It is done in places, always by white men, of course; but where mules and donkeys are plentiful the effort is hardly worth while, except in areas infested with the tsetse-fly. This is fatal to domestic animals, but has no evil effect upon zebras. In such territory there may be a future for a domesticated zebra, unless we are fortunate enough to exterminate the insect.

Quagga or Zebra, which shall we call it? The name Quagga is only a native one which reproduces the sound made by one of the species. We all know the stripes of the zebra, but it would need a long story to tell how these stripes and other distinctive markings differ in the various species. All zebras are heavy-headed and long-eared, and all of them have narrow hoofs and scanty manes and tails like the asses.

The Common Zebra is now unhappily a name wrongly applied to this alert and wary creature which once teemed in Cape Colony. The common zebra is to-day an uncommon zebra, and must be sought in hilly solitudes, where it is as much at home as an antelope.

What the different zebras are called

Throughout the whole of East Africa, from Abyssinia to Zululand and westward to southern Angola, zebras of different species are found. Distinguished mainly by the pattern of the black stripes, we have the following varieties: Böhm's Quagga, Jalla's, Crawshay's, Selous's, Chapman's, Wahlberg's, Burchell's, Foa's (a very rare species confined, it is believed, to a small area on the north bank of the Zambezi), and Grévy's Zebra, the largest and handsomest of the tribe, and named after the French president during whose term of office it was discovered.

Except those which haunt the hills, zebras assemble in herds and keep company with ostriches and gnus and often with springboks. It is a great mutual-help society to guard one another against surprise by foes. The ostriches are the living watch-towers peering high across the plains; the zebras and other animals furnish keen scenting power.

Zebras are a favorite food of lions, which sometimes conspire to hunt them in company. One or two lie low while others drive the zebras toward the ambush. That zebras have thriven and increased in numbers as they have done is another proof that the presence of the flesh-eaters does not deny happiness and freedom from fear to their victims.

The asses belong entirely to the old world

Farthest from the true horses, the zebras are, of course, next to the asses, which form a very interesting group. These are entirely natives of the Old World: the Syrian Wild Ass; the Onager of Persia, Baluchistan, the Punjab, Sind and Kach; and then the most horse-like of all, the Kiang of the Tibetan highlands.

Before they got the horse, the Assyrians had tame donkeys, and so had the Babylonians and the Egyptians. We read in the Bible, in the Book of Job, that Job had a thousand donkeys. Abraham had large numbers of them, and it was donkeys which the sons of Jacob brought down to Egypt to carry back the grain that was to save them from famine. Probably they were used to carry burdens on their backs much as they are used in the western mountain region under the name of burros.

There is an old gibe against the donkey: "Why does only an ass eat thistles? Because only an ass would." Well, thistles are precious to a hard-mouthed animal which has from time beyond human knowledge existed in desert places, where Nature is kind only to prickly

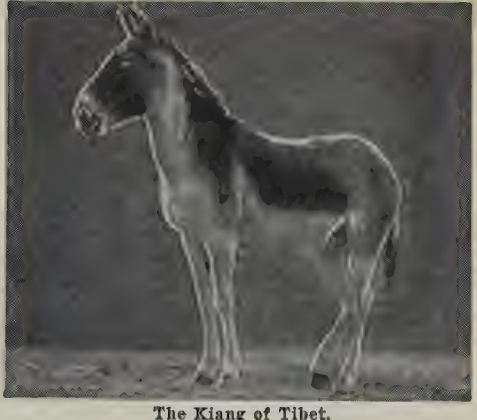
LITTLE BROTHERS OF THE HORSE

Burchell's Zebra.

Shetland Pony.

A donkey plow team at work on an English farm.

The Wild Ass of Asia.



The Kiang of Tibet.

growths which defy drought and dust and hardship. It is this long, long training in stony-ways that has made the donkey the sure-footed creature it is.

THE MULE IS MUCH USED IN THE SOUTHERN STATES

The Mule is the offspring of the male ass and the female horse. The mule itself cannot reproduce its kind. The animal has been used by man from early times, and in Southern Europe, from the Greek and Roman periods to the present day, many fine mules have been bred. While chiefly used as a beast of burden or to draw heavy loads, in Italy and in Spain many are bred for carriage use.

In the United States millions of mules are in use, and breeding them for market is an important industry in Missouri, Tennessee, Kentucky and other states. Nearly all are used on farms and for hauling. Few are used for riding or to draw carriages. They have never been much used in Canada.

The mule has some qualities of both parents, and in others it is superior to either. In size it is nearer the horse, but in shape it is more like the ass. Like the ass, also, it is sure-footed, obstinate and inclined to be treacherous, and can live on poor food on which a horse would starve. In intelligence and endurance it surpasses both its parents.

WHAT IS THE SOURCE OF OUR COMMON DONKEYS

Where did we get our domestic donkeys? Opinion is divided. Some authorities hold that it is simply the Somali Donkey transported to Europe. But against this is the fact that the stripe down the centre of its back is less distinct than in ours, and there is no second stripe crossing the shoulders. These markings we get in the Egyptian Donkey, and so presumably Egypt furnished Europe and South America with this patient beast of burden.

In silent mysterious Tibet we find the strange horse-like Kiang, which ranges up to 16,000 feet above sea-level. In that solitude the animals are as careful to set sentries and to feed with one ear forward and one ear back as if they lived among lions in Africa or tigers down in the Indian plains. They are as fleet as deer among the mountains, they swim icy rivers, and so shame the African donkeys, which have as great a horror as camels of crossing a mere stream.

THE TARTARS USED THE ROVING ASSES OF ASIA AS THEIR STEEDS

The Kiang is a 13-hands animal—that is to say, his height at the highest part of the back, behind the neck, is 52 inches, a hand being four inches. Now, the Onager, of which there are several species, is eight inches smaller, and would seem to be more closely related to the Mongolian asses, called the Chigetai or Dziggetai, lightly built animals which were the old steeds of the ancient Tartars.

Asses have served men in the East as long as horses, longer in some parts, but they have never received the care that horses have gained; they have never inspired poets to song, nor so won the hearts of their owners as to share human tents and rations as Arab horses do. France set the world an example with donkeys. Certain Frenchmen developed what is called the Poitou breed of asses, real giants of the order, up to 16 hands —the ideal height for a brougham horse. Italy, Spain and America also breed very large donkeys.

Northern countries have never done well by the donkey. The animal belongs by nature to warm lands and wide spaces. They do not thrive in damp and rigorous climates. The donkey there is a disappointed creature. There lurks a savage instinct in its brooding heart. It is trained and broken to work, but never really conquered. The old wild strain is there, and the most trusted donkey may some day break out unexpectedly and attack its owner.

THE MEMORY OF THE WILD THAT LINGERS IN THE MIND OF THE DONKEY

It happens again and again, and donkeys need more careful watching than any other member of the Horse Family. The ass has borne many blows and cruel privations with patience and a certain mute dignity, but fire smolders in that stubborn, courageous heart. Stupid the beast is not. On the contrary, where horses and donkeys herd together in our fields a donkey is always the leader.

There is a good deal to be said for the toiling, ungrudging, ill-used and slowly angered ass. He has much against us, yet he has wrought heroically for us since man first became an owner. "A righteous man," said Solomon, "regardeth the life of his beast," and the donkey has ever earned corn and kindness.

THE NEXT STORY OF ANIMAL LIFE IS ON PAGE 2139.

WHAT THIS STORY TELLS US

THE complicated lock of the present day is very different from the simple lock of a thousand years ago. The locksmith was an important man in the Middle Ages and made some wonderful locks, though they cannot compare with the locks of the present day. In our times the burglar and the locksmith are waging constant war, and the locksmith is making better and better locks, because the burglars have grown more and more skillful. The best locks of the present day afford almost perfect security, but some intelligent burglar may discover a method of opening them. We show you in the pictures some of the simplest forms of locks and also some of the more complicated. The best lock of these days is an interesting bit of mechanism, and the great vaults look as if they were too strong for any thief.

HOW A LOCK IS MADE

CONTINUED FROM 1954

THE lock was probably the first invention of man when he had become sufficiently civilized to desire to keep things. Before that a hollow tree, a cave, a hut of branches was his dwelling; the skin of an animal protected him when he was cold; his food supply was drawn from the wild animals and fish in the woods and streams. When supplies ran short he could easily move, for there was nothing to move but his own body. There was nothing worth stealing and so there was no idea of property rights.

But he moved a step upward—he became a herdsman, a shepherd, a farmer, a mechanic in a rude way. He acquired pots, pans, kettles, weapons, tools, and all of them took so long to make that he valued them, and then there came to him the idea that he must invent a way to keep secure these things when he had to be away from his dwelling-place, or was asleep at night. The *lock* was the result of his idea.

This was probably not more than five thousand years ago, for the oldest traces that we have of locks are among the early Egyptians, and the next in order are of Chinese origin. There has been a great improvement in locks during the past hundred years, and, wonderful to relate, the catalogues show more than sixty-five different kinds, each of these being for a special purpose. Thus we have air-locks, automobile locks, barn-door locks, keyless locks, padlocks, car and switch locks, safe-deposit locks, combination safe locks, and many others.

At first the Romans and Greeks had very simple safeguards. A leather thong tied in curious knots around the handle of the door was the only lock, the knack of unloosing it the sole key. Then bars or bolts were used, and we can find in old writings how the ancients invented devices for controlling them. A leather thong with a loop or a hook on the end was inserted through a hole in the door, and this would move the bolt in the manner required. So the bolt was a rude lock in the same degree that the thong was a rude key. Later in their history they had real locks and keys, for keys and traces of locks have been found in the ruins of their camps and cities.

Some of the locksmiths of the Middle Ages did very beautiful work and made ingenious structures which, however, could not resist master keys, picks or shelter keys in the hands of skillful workmen. Some of these Middle Ages locks for great buildings are monsters in size, with keys two or three feet long. Some, made with crude hand-made tools, are beautiful miniature locks with keys no more than one-half inch in length. In some large museums you may find collections of locks showing the wonderful craftsmanship of the skilled workers.

THE LOCKSMITH AN IMPORTANT FIGURE IN THE MIDDLE AGES

In the sixteenth century in Germany, Italy, France and England the locksmith was a very important figure. He was an artist in bronze, iron and copper; his secrets were carefully guarded; his apprentices were numerous and were distinguished by a special dress. Only a few of his locks have been preserved to us, but there are fine collections of keys in the museums of Europe, and from these we can grasp the nature of the lock and the beauty of its designs. Little figures, escutcheons and armorial bearings, ornaments and piercings transform our little insignificant "opener" into an object of art. The day of factories had not dawned, and every lock and key was hand-made, and called for the devoted skill and patience of the master-locksmith or clever apprentice. Gone were the large sickle-shaped keys of antiquity, borne on the shoulder of warden or slave. The lady of the house wore the keys of still-room, linen-chest and plate closet suspended from her girdle as an ornament, as well as an essential part of her dress.

Ornamental locks and keys are sometimes used to-day, but they are generally copies of those made in the sixteenth century, and, except for their mechanical difficulty, are not superior in any way to these. The medieval locksmith devoted his skill to the ornamenting and elaborating of his locks; he did not make them secure against robbers. With the growth of banks, the increased use of money, the greater accumulation of wealth, due to the invention of machinery, strong need arose for greater means of security.

THE GREATEST OF THE MODERN LOCKSMITHS

In the first half of the nineteenth century were laid the foundations for the wonderful development of the lock-making industry which has taken place in the last fifty years. Perhaps the most widely known name in this trade is Yale. Linus Yale, Sr., started as a lock-maker about 1840. He made a brilliant record as a maker of bank locks, and died in 1857, after making his mark upon the trade. Then came Linus Yale, Jr., who invented the famous pin-tumbler locks which are known all over the world. In this lock Yale went back to the ancient Egyptian lock for his principle, and made a small flat key instead of the cumbersome keys previously used. Many other improvements were made by Mr. Yale, who may be called the greatest of modern locksmiths.

No matter how difficult a lock may be, there is always a point of danger in the keyhole. Many devices to hide the keyhole, and even to take the place of a lock proper, have been tried, but the only one in general use is the combination lock. This is a lock in which the arranging of the internal parts in their proper positions is done from the outside by merely using numbers or letters in their right order. These numbers show on a disk which is usually marked up to 100. In this case the only key is a secret, which is to use the right figures in correct order. Where letters are used the lock may be set to open only when a particular word is spelled.

These improvements made the combination lock almost unpickable. But still there was a secret, which, if known, would open the lock, and burglars used to force by torture the possessor of this secret to give it up. This was the origin of the famous masked burglars, which resulted in robberies amounting to millions.

THE TIME LOCK WHICH GUARDS THE VAULTS

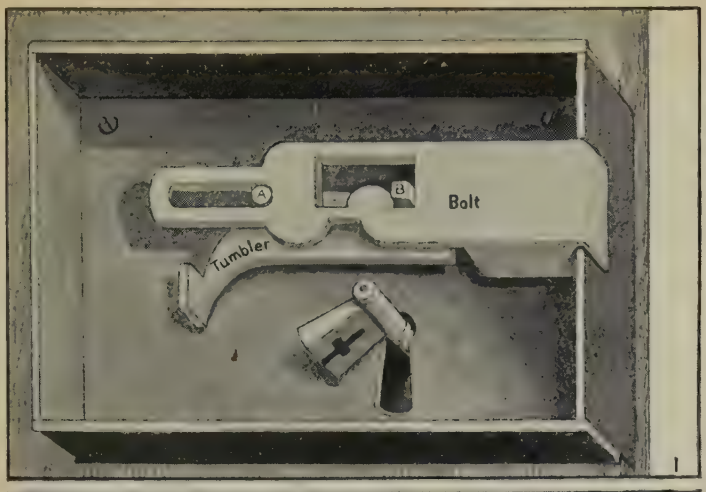
Then the inventors took another step and produced the time lock, which can be opened only at certain hours. Still the burglar found a way of introducing liquid explosives into the space surrounding the lock spindles. Many burglaries were committed in this manner.

The problem was to make the introduction of these explosives impossible, and to do this the spindle-holes had to be done away with. This is done by a motor device working with a time lock. The motor throws the bolts and draws them back according to the setting of the time lock. And the door of the safe is as secure as any other part of it. The only way to overcome it is by such force as will destroy the whole structure.

We have to-day locks of many kinds, and it seems that the manufacturers have made our treasures secure. It has come to be a contest between the burglar and the locksmith, each trying to overcome the other. The locksmith seems to be gaining, for his locks are much more difficult to pick than formerly.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 2177.

HOW THE KEY TURNS THE LOCK



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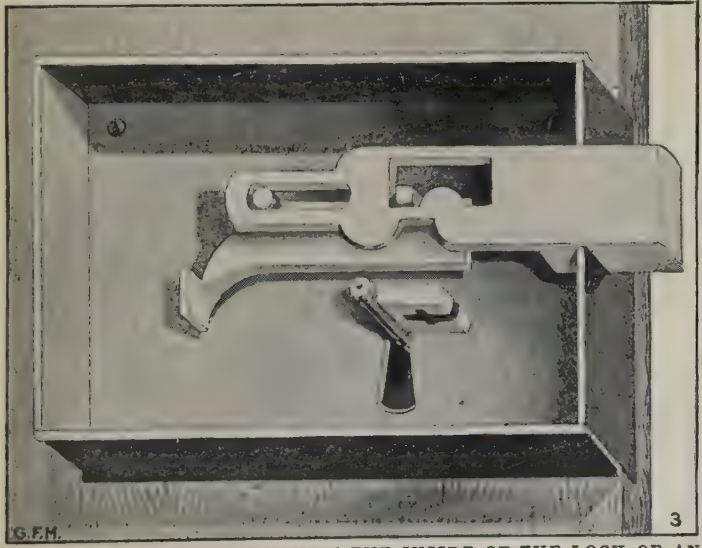
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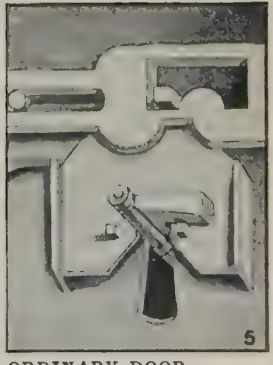
Locks are as old as civilization, and were first made of wood. It was in the reign of Alfred the Great that locks were first manufactured in England, but there was little improvement in their construction until the end of the eighteenth century. Since that time there have been marvelous developments, until we have the elaborate and costly locks shown on these pages. Here we see how the common tumbler lock works. This is the ordinary cheap lock found on cupboards and drawers. As shown in this picture, a metal "tumbler" works on a pivot, A. A stud, B, projects from the tumbler and fits into a notch in the bolt, preventing the bolt from moving either way. But when the key is turned, as seen in picture 2, the "bit," or flat part of the key, lifts the tumbler and enables the bolt to be pushed along as seen in picture 3. As soon as the key is turned right around, the tumbler falls, its stud fitting into a second notch in the bolt and holding it firm. Picture 4 shows the wards, or projections, which prevent any key but one specially cut to fit the lock from turning around, and in picture 5 we see how the right key can be turned over the wards.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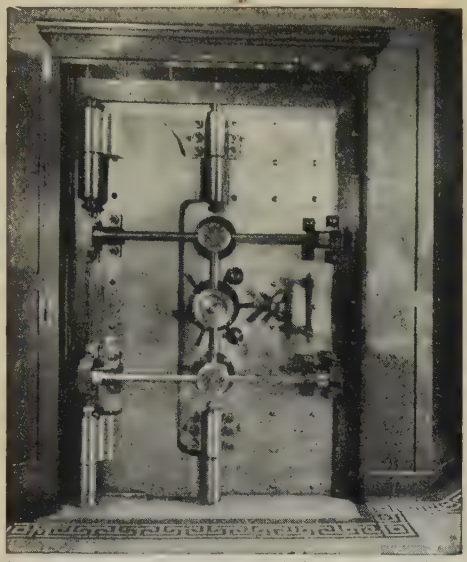
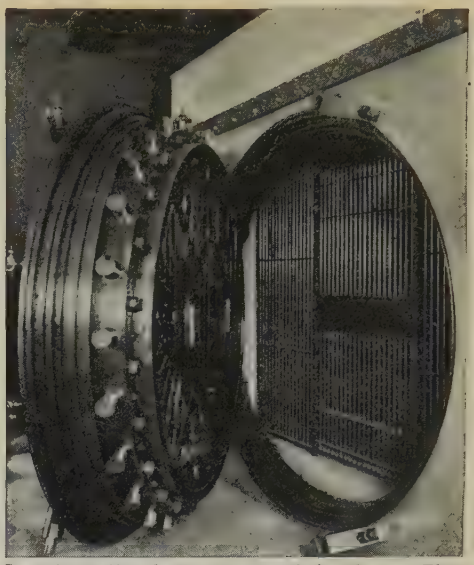
G.F.M.

THESE PICTURES SHOW THE INSIDE OF THE LOCK OF AN ORDINARY DOOR

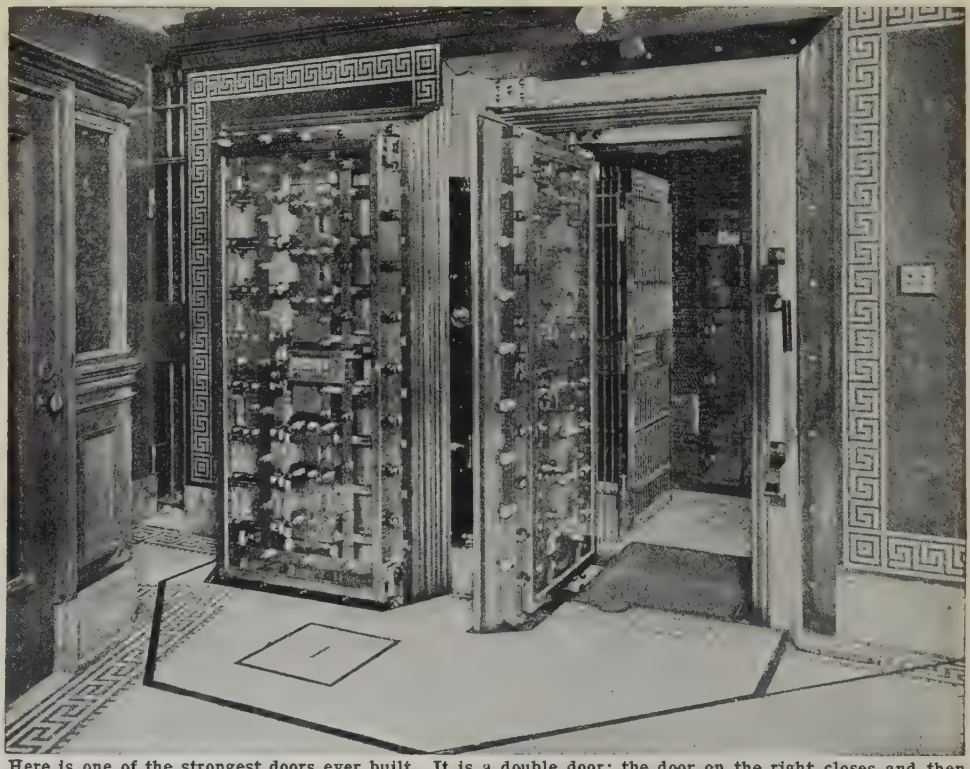
DOORS THAT COST THOUSANDS OF DOLLARS



Our great-grandfathers kept their treasures in a strong box made of wood bound round with iron. To-day a skilled burglar would laugh at such a treasure-store, and we build wonderful burglar-proof and fire-proof steel vaults, with doors that often weigh more than twenty tons each.

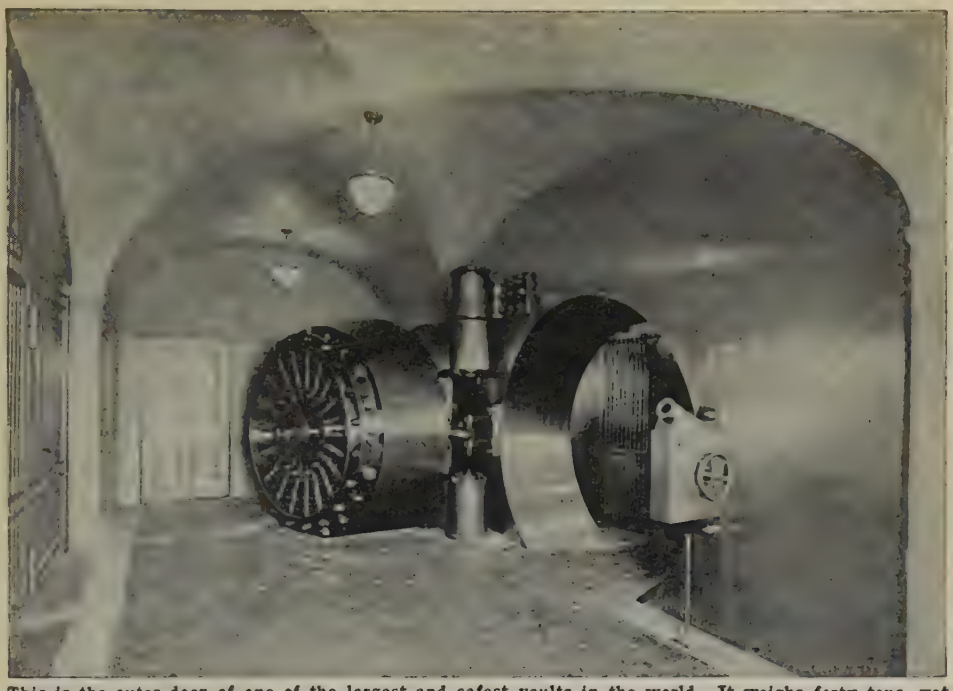


Sometimes the doors are round in shape. They have a marvelous system of bolts and fastenings, and the lock can be set to open at a fixed time. Once the door is locked, no human power can unlock it till that time arrives. At the exact hour levers fall, and then the door can be opened.

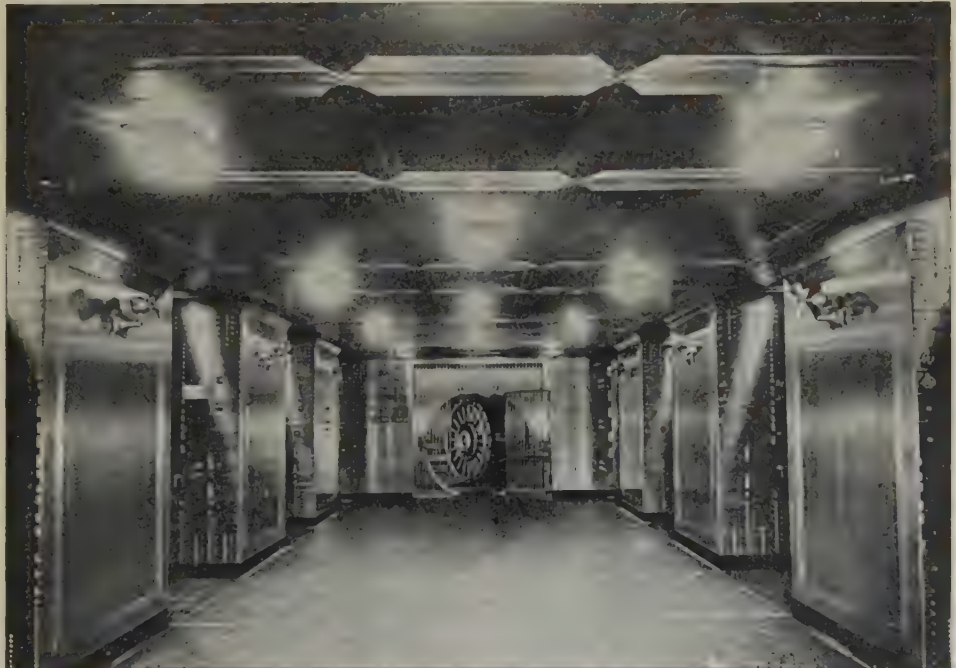


Here is one of the strongest doors ever built. It is a double door: the door on the right closes and then the one on the left is shut over it. This door cost more than $5,000. The key has a dial upon it with a number of letters that can be arranged in thousands of ways. Once the door is locked, it cannot be unlocked unless the letters on the key are arranged exactly as they were when the door was locked.

WHERE MILLIONS ARE SAFELY KEPT



This is the outer door of one of the largest and safest vaults in the world. It weighs forty tons, yet swings easily upon ball bearings. Notice the great bolts around the rim which shoot past the rim. The tube to the right is a telescope through which only the person working the combination can see the dial, which is well protected. The combination is worked by means of the wheel beside the box.

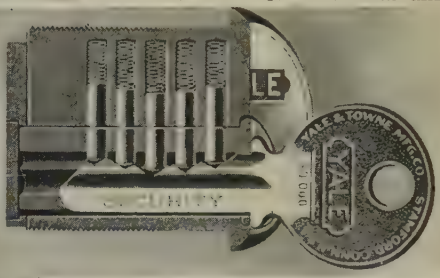


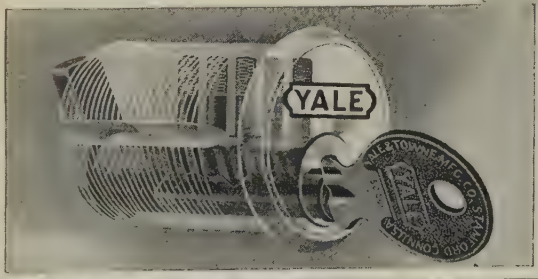
Here is the inside of the underground vault, the door of which we saw above. To the right and left are hundreds of boxes which are rented to those who wish a place in which to keep their papers, jewels and other valuables. Some boxes are opened by combinations and some by keys, as shown on other pages.

HOW LOCKS WORK IN HOUSE AND BANK

This picture shows a lock cut through the middle. Inside the lock are several little steel pegs of different lengths, called pin-tumblers, made in two or more parts. When the key is out they are pushed toward the bottom by the springs, and as part of each is in the outer cylinder and part in the inner, they will not allow the inner cylinder to turn around. The bolt is attached to the inner cylinder and moves with it. Let us push in a key and see what will happen then. It is easy to find a key which will slide into the keyhole even though it was not made for that particular lock. The keys look much alike.

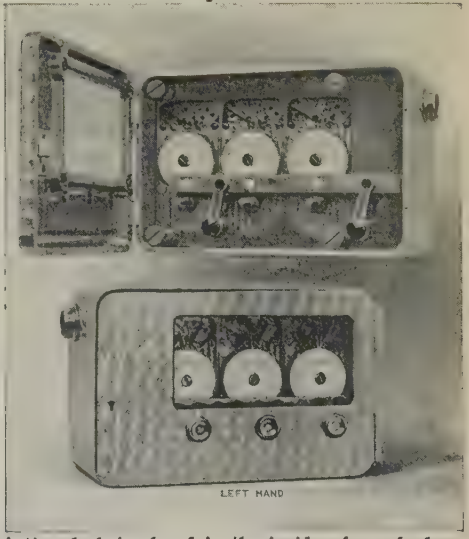
Here we see the proper key pushed all the way in. Notice each one of the little pins has been pushed up toward the top of the lock. Notice, too, that the division in each little pin comes exactly at the lock. You can see that a twist of the key would turn the inner cylinder inside of the larger one. The end of the cylinder away from the key is connected with the bolt and turns it. But if one of the notches in the key were a little deeper or a little shallower, one piece of the pin would be partly in one cylinder and partly in another and would not allow the inner cylinder to turn. A difference of one-fiftieth of an inch in the position of one pin will prevent the cylinder from turning.



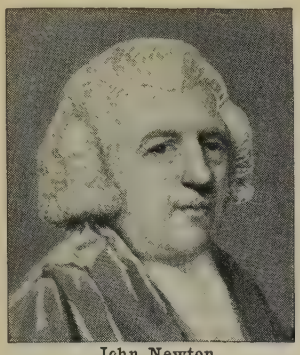


This is how the lock would look if it were made of glass. You can see the inner cylinder turning, and can see the end of the pin-tumblers as they are being turned inside the outer cylinder. The bolt is moved by the projection at the rear, which you see turning. It is very easy for the manufacturers to make the length of the tumblers or the depth of the notches just a little different. They say that 27,000 locks are made so that no key will unlock more than one. In the next 27,000 locks there is also one which your key will open. If you were to try every lock you saw you might find one your key would unlock, but it would take a very long time, and you might never find the duplicate.

Many people have a box in a safe-deposit vault, such as we saw on another page, in which they keep valuable papers or jewels. The boxes are made of steel and are easily drawn out when the doors are opened. Some of the doors require two keys and some have combination locks.



A time lock is placed in the inside of a safe door. It can be set to open any number of hours after, and until that time has come, no one, even if he knows the combination, can open the door. Each of these dials can open the door. There are three for safety, as one might possibly get out of order.



John Newton.

Cowper in his study.

Mrs. Unwin.

POETRY GOES BACK TO THE COUNTRY

CONTINUED FROM 1872

IN the later part of the seventeenth century and the early part of the eighteenth, English poetry almost completely deserted the country for the town.

Shakespeare and the other Elizabethans had been at heart countrymen, and had kept country life as a background to nearly all their writings. So had Milton, less freely and in a more formal way. But in the poor drama that followed Shakespeare, and in the shallow courtliness of the later Stuart reigns which led up to the town-bred poetry of Dryden and Pope, nature almost faded out from English literature.

The only poet who showed a heart open to the country during that period was Robert Herrick. His heart was in the town, but he was obliged to live in the country; and being a true poet, he reflected his surroundings and wrote many a gay little song about his Devonshire flowers. Most of the poetry of the time, however, was town-born.

Still, even while Alexander Pope was at the height of his fame, Nature here and there was beginning to play her part afresh, until, before the eighteenth century closed, she had become the ruling power in the world of song.

You will see, too, that as there grew up the feeling for nature as the background of our human life, so there grew with it a new sense of mankind as a whole. Writers felt that the everyday lives and thoughts of simple men were much more real than the vague outline of Man, which was the subject of the principal work of Pope. Also, along with the growth of delight in the beauty of the world, and of sympathy with the lives of all kinds of men and women, a real interest in animal life sprang up. Thus friendship with animals began to find expression in verse.

There was one more new feature of eighteenth-century poetry. Men's thoughts were turned back to the poetry of the past by Dr. Thomas Percy's Reliques of Ancient Poetry. This revived many old ballads, and awoke the slumbering sense of romance. In tune with this movement was the sham ancient poetry which, under the title Ossian, was foisted on the public by a Scottish schoolmaster named James Macpherson, who afterward became a member of the British Parliament. Of the same kind were the forged antique poems of the morbid boy genius of Bristol, Thomas Chatterton, who took his own life in his eighteenth year. Thus arose the desire, afterward more fully expressed by Scott in prose romance, to look back curiously into the poetry and his-

tory of the past. With a revived past and a newly seen present, poetry had a new start.

One of the first poets in whom the love and influence of nature are to be traced is the poet James Thomson. In 1726 he published his poem on Winter, which was afterward followed by three other similar poems that completed his Seasons. But the fact is that a movement toward nature poetry was in the air at that time. In 1725 Allan Ramsay, a Scottish bookseller who had been busy in discovering ancient Scottish ballads, had published his pastoral, The Gentle Shepherd. In 1727 John Dyer, a Welsh poet, gave to the world his Grongar Hill, a poem descriptive of the view from a height in South Wales. Both these poems were liked enough to show that the world was ready to receive thankfully the poetry of woods and fields, though professional critics in city clubs might protest against such a choice of subjects.

THE YOUNG SCOTSMAN WHO CAPTURED LONDON WITH HIS COUNTRY POETRY

James Thomson, son of a Scottish minister, went straight to London in his twenty-fifth year, and gave the great city the country in his poem Winter. He sold three editions of it in a year, and secured orders for describing the other seasons in a similar way. Later he wrote with only moderate success for the stage, but received such comfortable official appointments as enabled him to live in the spirit of his final poem, The Castle of Indolence. This charmed his readers when it was published in the year of his death, 1748.

Thomson's Seasons was written in blank verse—daring departure in those days; and his Castle of Indolence was in the same metre as Spenser's Faerie Queene, and was plainly an imitation. The poet rewrote and expanded much of The Seasons, so that its length grew from 3,902 to 5,403 lines, if the first and the last editions are compared. There can be no doubt that the poet was a sincere lover of nature. Sometimes he paints his landscapes in words that are too general, but he can describe a scene with his eye on the object all the while. Here, for instance, is his description of birds building their nests:

Now 'tis naught
But restless hurry through the busy air,
Beat by unnumbered wings. The swallow sweeps
The slimy pool, to build his hanging house
Intent. And often, from the careless back
Of herds and flocks a thousand tugging bills
Pluck hair and wool; and oft, when unobserved
Steal from the barn a straw; till soft and warm,
Clean and complete, their habitation grows.

THE POET WHO TURNED MEN'S EYES AND THOUGHTS BACK TO NATURE

That Thomson turned men's eyes and thoughts back to nature, no one can doubt. Though he does not compare in exquisiteness with some later poets who have interpreted the beauty of the world, we should read him with respect, for his influence as a writer was both wholesome and sincere.

He had a happy and contented nature underneath a lack of energy, and he was morally a sound man. Indeed, he has summed up his own character in one of the stanzas of The Castle of Indolence, which may serve at once as showing the poet's aims and the formal style of his last poem.

I care not, Fortune, what you me deny,
You cannot rob me of free Nature's grace;
You cannot shut the windows of the sky,
Through which Aurora shows her brightening face;

You cannot bar my constant feet to trace
The woods and lawns by living stream at eve.
Let health my nerves and finer fibres brace,
And I their toys to the great children leave.
Of fancy, reason, virtue, naught can me bereave.

Two other poets were publishing their first poems in the same year, 1747. They were Thomas Gray and William Collins, the first a Cambridge and the second an Oxford man. Both were choice and scholarly; both liked to write in the ode form so heartily detested by Doctor Johnson. Both left verse which will always live because of its perfection, though it does not reach the summit of literary greatness.

THE AUTHOR OF THE ELEGY WRITTEN IN A COUNTRY CHURCHYARD

But only Gray had any really great and lasting influence on English literature. He had it because of his intense love of beautiful scenery, expressed rather in his letters than in his poems. Gray did not believe in writing descriptions of nature in verse. His idea was that description should be used only here and there as literary ornament, and should not be the main subject. "The plough-

man homeward plods his weary way," is just an incidental touch to a scene telling of nightfall.

The breezy call of incense-breathing morn,
The swallow twittering from its straw-built shed,
The cock's shrill clarion, or the echoing horn

are not described for description's sake, but as a contrast to the stillness of the village dead in the line:

No more shall rouse them from their lowly bed.

But if Gray had believed in description, how wonderful his pictures would have been! His passion for lovely scenery, so visible in his letters, is hardly hinted at in the restraint of his verse. Yet no one could have made a picture in a line as he could make it without seeing and feeling intensely. The Elegy, the most perfect quietly thoughtful poem in English, is a tantalizing promise of the description we might have had if Gray had believed in description as something more than mere ornament.

Both Gray and Collins gave themselves up to ode-writing, in which abstract ideas, such as Misfortune, Quiet, Envy and Age are treated as persons and spelled with a capital letter. They are indeed poetical according to poetical rules, but such an artificial fashion soon tires us and we look for simple things. We are glad to have some well-framed odes in the Gray and Collins style, but the craftsmen who made them so well live most surely in our memories and hearts by simpler poems—Gray by his Elegy, which returns again and again to our minds with all its original beauty, and Collins by his unsurpassed lament for those fallen in battle.

How sleep the brave who sink to rest
By all their country's wishes blest!

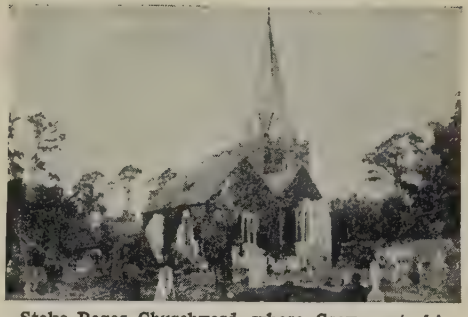
William Cowper.

Thomas Gray.

James Thomson.

William Collins.

The Vicarage at Great Berkhamsted, where William Cowper was born.



Stoke Poges Churchyard, where Gray wrote his beautiful Elegy.

When Spring, with dewy fingers cold,
Returns to deck their hallowed mould,
She there shall dress a sweeter sod
Than Fancy's feet have ever trod.
By fairy hands their knell is rung,
By forms unseen their dirge is sung;
There Honor comes, a pilgrim gray,
To bless the turf that wraps their clay,
And Freedom shall a while repair,
To dwell, a weeping hermit, there!

Collins was born at Chichester in December, 1721, and he died on June 12, 1759, after six years of insanity, partly caused, perhaps, by the feeling that his poetry was not appreciated.

Gray was all his life a Cambridge man, an unmarried don, a constant student

and a fastidious writer. He wrote enough to be immortal, but never showed the world all he had in him, because he did not dare to let himself go. He serves as a check for all who are inclined to write poetry with slackness. His aim is perfection, but it is a perfection that does not do more than keep "the noiseless tenor of its way."

THE GENTLE POET WHO WAS HAUNTED BY CRUEL FEARS OF GOD

The poet who best shows the later-eighteenth-century escape from the witty bookish verse, made in a library according to neat rules by Pope, was William Cowper. He regained freedom in style and wide choice of subject. His flow of feeling was as natural as his flow of verse. No topic was too homely for his pen. Cowper had an unerring rightness of feeling, whether his sympathetic eye rested on mankind as a whole, or men as individuals, or the friendly world of animals, or the changeful beauty of the outdoor world.

His gentle spirit was invariably kindly, except, alas, in one respect, for he was haunted by doubts about the welfare of his own tender soul. It is a strange thing that the kindest of all the poets could not be sure that God would be as kind to him as he himself was kind to all living things!

Whether he was driven into insanity from time to time by this false idea of God, or whether insanity drove him into so strange a misunderstanding, it is hard to say. But the life of the most pious of all poets was tormented by fears for the fate of his own soul, according to the narrow belief of his day. Probably he was unhappy because of these returning fits of insanity, during which he believed he was doomed for his wickedness to eternal punishment. This was a gloomy belief of the day, in which the anger of God was insisted upon rather than His love.

THE SAD CHAPTER IN THE LIFE OF A GOOD MAN

We should not introduce here this awful view were it not that it spoiled the life of a good man and skillful poet. In fact, Cowper's goodness, and his poetry, and his fear of the future were the three things that make up his whole life. A well-educated, scholarly young man, with influential friends, Cowper had the offer of an appointment as Clerk of the Journals of the House of Lords, but distrust of himself drove him out of his mind, and he was sent into a home to be cared for. When he recovered, he retired from active life and lived with friends in the country as a boarder. To these friends, the earliest of whom were Mr. and Mrs. Unwin, Cowper became deeply attached. After their death his despondency grew.

His friends were very religious, and with them hymn-writing was a favorite duty. At Olney in Buckinghamshire, where he lived more than a quarter of a century, Cowper and his friend, the clergyman John Newton, wrote a whole book of hymns, in which Cowper's contribution numbered sixty-seven.

It was found that verifying was a pleasant and calming recreation, and so Cowper's friends gave him subjects on which to practice. When he was fifty-one years of age his first volume of rhymed verse was issued, and three years later (1785) his principal work, The Task, written in blank verse, was published. Before the poet's death, fifteen years later, eleven editions of this had been printed, with other poems added.

THE POET WHO LOVED A FROLIC AND CHAMPIONED THE ANIMALS

It seems a dull life, this of writing daily in a quiet country place to ward off depression, but when the cloud of religious helplessness was not resting on him the poet was mildly happy. His nature was tender, his sympathies were active. He was a loyal friend with loyal friends about him, and his natural temperament, when unstrained, was rippling with a quiet sense of humor. These qualities appear equally in his poems and his charming letters.

The ease of Cowper's writing should not blind us to the fact that his interest is singularly wide and varied. He was a great lover of the outdoor world, the coziest of friends indoors, a genuine understander of animals, whom he warmly championed. He loved a frolic, as we can see by John Gilpin. He was an ardent patriot, a thoughtful politician and a tender humanitarian afire with the love of freedom. Indeed, William Cowper brought poetry down into the homely ways of men, and at the same time kept it poetry without commonness. In doing so he, with Robert Burns, completed the transformation of poetry from a scholar's exercise, as it had been under Pope, to a picture of the hearts of men.

THE NEXT STORY OF LITERATURE IS ON PAGE 2135.

A CHILDREN'S POEM BY WORDSWORTH

IN the poetry of William Wordsworth there is much tender sentiment expressed in simple words which the youngest reader could not fail to understand. His poetry is at times not of a very high order, though he is capable of the best; but it is always redeemed by tender and just sentiment. That may be said of his poem The Pet Lamb. The poet says "the dew was falling fast." Now, the dew does not fall; it rises. But this is what we call "poetic license." As poetry is not the mere statement of fact, but the expression of the imagination, it must not be bound by the same rules as the describing of a machine. The poet is allowed to use words that suggest to the mind ideas and pictures which, though not strictly true, may be more beautiful than fact. All such departures from mere fact are called "poetic license," meaning that the poet has taken this liberty for effect.

THE PET LAMB

CONTINUED FROM 1890

THE dew was falling fast, the stars began to blink;
I heard a voice; it said,
"Drink, pretty creature, drink!"
And looking o'er the hedge, before me I espied
A snow-white mountain lamb, with a maiden at its side.

Nor sheep nor kine were near; the lamb was all alone,
And by a slender cord was tether'd to a stone;
With one knee on the grass did the little maiden kneel,
While to that mountain lamb she gave its evening meal.

The lamb, while from her hand he thus his supper took,
Seem'd to feast with head and ears; and his tail with pleasure shook:
"Drink, pretty creature, drink!" she said in such a tone
That I almost received her heart into my own.

'Twas little Barbara Lewthwaite, a child of beauty rare!
I watch'd them with delight; they were a lovely pair.
Now with her empty can the maiden turn'd away;
But ere ten yards were gone, her footsteps did she stay.

Right towards the lamb she look'd, and from that shady place
I unobserved could see the workings of her face;
If nature to her tongue could measured numbers bring,
Thus, thought I, to her lamb that little maid might sing:

"What ails thee, young one—what? Why pull so at thy cord?
Is it not well with thee—well both for bed and board?
Thy plot of grass is soft, and green as grass can be;
Rest, little young one, rest; what is't that aileth thee?

"What is it thou wouldst seek?
What is wanting to thy heart?
Thy limbs, are they not strong?—and beautiful thou art!
This grass is tender grass; these flowers they have no peers,
And that green corn all day is rustling in thy ears.

"If the sun be shining hot, do but stretch thy woollen chain;
This beech is standing by, its covert thou canst gain;
For rain and mountain storms, the like thou need'st not fear,
The rain and storm are things that scarcely can come here.

"Rest, little young one, rest; thou hast forgot the day
When my father found thee first in places far away;
Many flocks were on the hills, but thou wert own'd by none.
And thy mother from thy side for evermore was gone.

"He took thee in his arms, and in pity brought thee home;
A blessed day for thee!—Then whither wouldst thou roam?
A faithful nurse thou hast; the dam that did thee yean
Upon the mountain-tops no kinder could have been.

"Thou know'st that twice a day I have brought thee in this can
Fresh water from the brook, as clear as ever ran;
And twice in the day, when the ground is wet with dew,
I bring thee draughts of milk, warm milk it is and new.

"Thy limbs will shortly be twice as stout as they are now,
Then I'll yoke thee to my cart like a pony in the plough!
My playmate thou shalt be; and when the wind is cold
Our hearth shall be thy bed, our house shall be thy fold.

"It will not, will not rest!—Poor creature, can it be
That 'tis thy mother's heart which is working so in thee?
Things that I know not of belike to thee are dear,
And dreams of things which thou canst neither see nor hear.

"Alas, the mountain-tops that look so green and fair!
I've heard of fearful winds and darkness that come there;
The little brooks that seem all pastime and all play,
When they are angry, roar like lions for their prey.

"Here thou need'st not dread the raven in the sky;
Night and day thou art safe—our cottage is hard by.
Why bleat so after me? Why pull so at thy chain?
Sleep—and at break of day I will come to thee again!"

As homeward through the lane I went with lazy feet,
This song to myself did I oftentimes repeat;
And it seem'd, as I retraced the ballad line by line,
That but half of it was hers, and one half of it was *mine*.

Again, and once again, did I repeat the song;
"Nay," said I, "more than half to the damsel must belong!—
For she look'd with such a look, and she spake with such a tone,
That I almost received her heart into my own."

GINEVRA

This poem in blank verse by Samuel Rogers tells simply one of the most dramatic stories that could be conceived. The legend of the awful chest is told of several English houses, but is probably of Italian origin. Let us hope it never was true. But the tale contains a warning to us to act always with prudence, and exercise forethought, even when jesting.

IF thou shouldst ever come by choice or chance
To Modena, where still religiously
Among her ancient trophies is preserved
Bologna's bucket (in its chain it hangs
Within that reverend tower, the Guirlandine),
Stop at a palace near the Reggio gate,
Dwelt in of old by one of the Orsini.
Its noble gardens, terrace above terrace,
And rich in fountains, statues, cypresses,
Will long detain thee; thro' their archèd walks,
Dim at noonday, discovering many a glimpse
Of knights and dames, such as in old romance,
And lovers, such as in heroic song,
Perhaps the two, for groves were their delight,
That in the springtime, as alone they sat,
Venturing together on a tale of love,
Read only part that day. A summer sun
Sets ere one half is seen; but ere thou go,
Enter the house—prythee, forget it not—
And look a while upon a picture there.
'Tis of a lady in her earliest youth,
The very last of that illustrious race,
Done by Zampieri—but I care not whom.
He who observes it, ere he passes on,
Gazes his fill, and comes and comes again,
That he may call it up when far away.
She sits, inclining forward as to speak,
Her lips half open, and her finger up;
As tho' she said, "Beware!" Her vest of gold
Broidered with flowers, and clasped from head to foot,
An emerald stone in every golden clasp;
And on her brow, fairer than alabaster,
A coronet of pearls. But then her face,
So lovely, yet so arch, so full of mirth,
The overflowings of an innocent heart—
It haunts me still, tho' many a year has fled,
Like some wild melody!
Alone it hangs
Over a mouldering heirloom, its companion,
An oaken chest, half eaten by the worm,
But richly carved by Antony of Trent
With Scripture stories from the life of Christ;
A chest that came from Venice, and had held
The ducal robes of some old ancestor.
That by the way—it may be true or false—
But don't forget the picture; and thou wilt not
When thou hast heard the tale they told me there.
She was an only child; from infancy
The joy, the pride of an indulgent sire.
Her mother dying of the gift she gave—
That precious gift—what else remained to him?
The young Ginevra was his all in life,
Still as she grew, for ever in his sight;
And in her fifteenth year became a bride,
Marrying an only son, Francesco Doria,
Her playmate from her birth, and her first love.
Just as she looks there in her bridal dress,
She was all gentleness, all gaiety,
Her pranks the favourite theme of every tongue.
But now the day was come, the day, the hour;
Now, frowning, smiling, for the hundredth time,
The nurse, that ancient lady, preached decorum;
And, in the lustre of her youth, she gave
Her hand, with her heart in it, to Francesco.
Great was the joy, but at the bridal feast,
When all sat down, the bride was wanting there.
Nor was she to be found! Her father cried,
"'Tis but to make a trial of our love!"
And filled his glass to all; but his hand shook,
And soon from guest to guest the panic spread.
'Twas but that instant she had left Francesco,
Laughing, and looking back, and flying still,
Her ivory tooth imprinted on his finger.
But now, alas! she was not to be found;
Nor from that hour could anything be guessed,
But that she was not!
Weary of his life,
Francesco flew to Venice, and forthwith
Flung it away in battle with the Turk.
Orsini lived; and long mightst thou have seen
An old man wandering as in quest of something,
Something he could not find—he knew not what.
When he was gone, the house remained a while

Silent and tenantless—then went to strangers.
Full fifty years were passed, and all forgot,
When on an idle day—a day of search
'Mid the old lumber in the gallery,
That mouldering chest was noticed; and 'twas said
By one as young, as thoughtless as Ginevra,
"Why not remove it from its lurking-place?"
'Twas done as soon as said; but on the way
It burst, it fell; and lo! a skeleton,
With here and there a pearl, an emerald stone,
A golden clasp, clasping a shred of gold.
All else had perished—save a nuptial ring,
And a small seal, her mother's legacy,
Engraven with a name—the name of both—
"Ginevra."
There then had she found a grave!
Within that chest had she concealed herself,
Fluttering with joy, the happiest of the happy;
When a spring-lock that lay in ambush there
Fastened her down for ever!

THE QUEEN AND THE FLOWERS

Since the fourteenth century England has had a poet laureate originally chosen from the poets of the day to celebrate the great events in the history of the country, but now no longer under any such obligation. The following poem, from Fortunatus, the Pessimist, was written by a former poet laureate, Alfred Austin, who died in the year 1913. He here retells in simple tuneful verse an old and beautiful legend.

THERE was a king in olden days
With black heart, scowling forehead.
The mighty trembled at his gaze,
And his sceptre was abhorrèd.

Alike to burgher and to boor
His grasp was hard and greedy:
He had no pity for the poor,
Indulgence for the needy.

Beside him sat a gentle queen,
Compassionate and holy,
Who fed the hungry, clad the mean,
And comforted the lowly.

Till with harsh words he her forbade
To visit, cheer, or aid them.
Then meekly, though her heart was sad,
She listened, and obeyed them.

It happed, one day, in hovel rude
A leper lay a-dying;
And there was none to take him food,
And none to soothe his sighing.

Forgetting all, with bread and meat
She filled a little wallet,
And, sallying out into the street,
Made haste to reach his pallet.

When lo! the king, with courtiers girt,
Came riding through the city.
The queen in terror raised her skirt,
To screen her work of pity.

Seeing her shrink and bow her head,
His brow began to pucker:
"Now show me what it is," he said,
"You hide below your tucker."

She spoke not, but uncovered it;
And look what it discloses!
Not wheaten loaf and dainty bit,
But myrtles, pinks, and roses.

"What gauds are these?" he fumed and cried,
"And wherefore were they hidden?"
"I disobeyed you," she replied,
And trembled to be chidden.

"Food was I taking where, ah, me!
A lonely leper cowers;
But the Lord Jesus, as you see,
Hath changed them into flowers."

The king dismounted from his horse,
First smelt pink, rose, and myrtle,
Then knelt, and, smitten with remorse,
Kissed her white hands and kirtle.

Henceforth he held no sumptuous state
In courtyard, hall, or stable;
The poor were welcomed at his gate,
The hungry at his table.

When died his queen, and in the tomb
Was laid with pomp and wailing,
Myrtle at once began to bloom,
And climb round slab and railing.

And even when the snow lies white,
And frosty stars are shining,
Clove pinks about her grave are bright,
And round it roses twining.

TO THE CUCKOO

William Wordsworth's ode to the cuckoo may be compared with that of Michael Bruce. Perhaps the most beautiful idea in Wordsworth's poem is the fourth line of the first verse.

O BLITHE new-comer! I have heard,
I hear thee and rejoice:
O Cuckoo! shall I call thee bird,
Or but a wandering voice?

While I am lying on the grass
Thy twofold shout I hear;
From hill to hill it seems to pass,
At once far off and near.

Though babbling only to the vale
Of sunshine and of flowers,
Thou bringest unto me a tale
Of visionary hours.

Thrice welcome, darling of the Spring!
Even yet thou art to me
No bird, but an invisible thing—
A voice, a mystery.

The same whom in my schoolboy days
I listen'd to; that cry
Which made me look a thousand ways
In bush, and tree, and sky.

To seek thee did I often rove
Through woods and on the green;
And thou wert still a hope, a love;
Still long'd for, never seen!

And I can listen to thee yet;
Can lie upon the plain
And listen, till I do beget
That golden time again.

O blessed bird! the earth we pace
Again appears to be
An unsubstantial fairy place
That is fit home for thee!

A SONG OF THE CAMP

A Song of the Camp by Bayard Taylor has such a wonderful swing and pathos to it that it fairly carries us off our feet.

"GIVE us a song!" the soldiers cried,
The outer trenches guarding,
When the heated guns of the camp allied
Grew weary of bombarding.

The dark Redan, in silent scoff,
Lay grim and threatening under;
And the tawny mound of the Malakoff
No longer belched its thunder.

There was a pause. A guardsman said:
"We storm the forts to-morrow;
Sing while we may, another day
Will bring enough of sorrow."

They lay along the battery's side,
Below the smoking cannon;
Brave hearts from Severn and from Clyde,
And from the banks of Shannon.

They sang of love, and not of fame;
Forgot was Britain's glory;
Each heart recalled a different name,
But all sang "Annie Laurie."

Voice after voice caught up the song,
Until its tender passion
Rose like an anthem, rich and strong,—
Their battle-eve confession.

Dear girl, her name he dared not speak,
But, as the song grew louder,
Something upon the soldier's cheek
Washed off the stains of powder.

Beyond the darkening ocean burned
The bloody sunset's embers,
While the Crimean valleys learned
How English love remembers.

And once again a fire of hell
Rained on the Russian quarters,
With scream of shot and burst of shell,
And bellowing of the mortars!

And Irish Nora's eyes are dim
For a singer dumb and gory;
And English Mary mourns for him
Who sang of "Annie Laurie."

Sleep, soldiers! still in honoured rest
Your truth and valour wearing;
The bravest are the tenderest,—
The loving are the daring.

THE AMERICAN FLAG

All Americans owe a great debt of gratitude to Joseph Rodman Drake for writing the stirring poem entitled The American Flag. The swinging verses cannot fail to create a glow of real feeling in every true patriot of the broad land.

WHEN Freedom, from her mountain height,
Unfurled her standard to the air,
She tore the azure robe of night,
And set the stars of glory there!
She mingled with its gorgeous dyes
The milky baldric of the skies,
And striped its pure celestial white
With streakings of the morning light,
Then, from his mansion in the sun,
She called her eagle-bearer down,
And gave into his mighty hand
The symbol of her chosen land.

. . . . . .

Flag of the seas! on ocean's wave
Thy star shall glitter o'er the brave;
When Death, careering on the gale,
Sweeps darkly round the bellied sail,
And frightened waves rush wildly back
Before the broad-side's reeling rack,
The dying wanderer of the sea
Shall look, at once, to heaven and thee,
And smile, to see thy splendours fly,
In triumph, o'er his closing eye.

Flag of the free heart's hope and home,
By angel hands to valour given!
Thy stars have lit the welkin dome,
And all thy hues were born in heaven!
And fixed as yonder orb divine,
That saw thy bannered blaze unfurled,
Shall thy proud stars resplendent shine,
The guard and glory of the world.
For ever float that standard sheet!
Where breathes the foe but falls before us?
With Freedom's soil beneath our feet,
And Freedom's banner streaming o'er us!

DOUGLAS, DOUGLAS, TENDER AND TRUE

This well-known poem was written by Dinah Maria Mulock.

COULD ye come back to me, Douglas,
Douglas,
In the old likeness that I knew,
I would be so faithful, so loving, Douglas,
Douglas, Douglas, tender and true.

Never a scornful word should grieve ye,
I'd smile on ye sweet as the angels do;—
Sweet as your smile on me shone ever,
Douglas, Douglas, tender and true.

O to call back the days that are not!
My eyes were blinded, your words were few;
Do you know the truth now up in heaven,
Douglas, Douglas, tender and true?

I never was worthy of you, Douglas,
Not half worthy the like of you;
Now all men seem to me like shadows—
Douglas, Douglas, tender and true.

Stretch out your hand to me, Douglas,
Douglas,
Drop forgiveness from heaven like dew,
As I lay my heart on your dead heart,
Douglas,
Douglas, Douglas, tender and true.

AS DOWN IN THE SUNLESS RETREATS

This poem by Thomas Moore shows him in a different mood from his other verses we have quoted in our Book of Poetry.

AS down in the sunless retreats of the ocean
Sweet flowers are springing no mortal can see,
So, deep in my soul, the still prayer of devotion,
Unheard by the world, rises silent to thee,
My God, silent to thee,—
Pure, warm, silent to thee.

As still to the star of its worship, though clouded,
The needle points faithfully o'er the dim sea,
So dark when I roam, in this wintry world shrouded,
The hope of my spirit turns trembling to thee,
My God, trembling to thee,—
Pure, warm, trembling to thee.

LIKE a blind spinner in the sun
I tread my days;
I know that all the threads will run
Appointed ways;
I know each day will bring its task,
And, being blind, no more I ask.

—HELEN HUNT JACKSON.

THE LORELEI

The Lorelei was written by the German poet Heine. The Lorelei was a siren maiden who with her singing beguiled poor sailors to their death on the rocks of the river Rhine.

I KNOW not what sorrow is o'er me,
What spell is upon my heart;
But a tale of old times is before me—
A legend that will not depart.

Night falls as I linger, dreaming,
And calmly flows the Rhine;
The peaks of the mountains gleaming
In the golden sunset shine.

A wondrous lovely maiden
Sits high in glory there;
Her robe with gems is laden,
And she combs out her golden hair.

And she spreads out the golden treasure,
Still singing in harmony;
And the song has a mystical measure,
And a wonderful melody.

The boatman, when once she has bound him,
Is lost in a wild sad love:
He sees not the black rocks around him,
He sees but the beauty above.
I believe that the billows springing
The boat and the boatman drown;
And that this, with her magical singing,
The Lorelei has done.

AFAR IN THE DESERT

This poem was written by Thomas Pringle, a Scotchman who went to live in South Africa. In these verses he gives us the call of the wild as only one who knows can give it.

AFAR in the desert I love to ride,
With the silent Bush-boy alone by my side,
When the wild turmoil of this wearisome life,
With its scenes of oppression, corruption, and strife—
The proud man's frown, and the base man's fear,
The scorner's laugh, and the sufferer's tear,
And malice, and meanness, and falsehood, and folly
Dispose me to musing and dark melancholy;
When my bosom is full, and my thoughts are high,
And my soul is sick with the bondman's sigh,—
Oh, then there is freedom, and joy, and pride,
Afar in the desert alone to ride!
There is rapture to vault on the champing steed,
And to bound away with eagle's speed,
With the death-fraught firelock in my hand,—
The only law of the Desert Land!

. . . . . .

Afar in the desert I love to ride,
With the silent Bush-boy alone by my side,
Away, away, in the wilderness vast
Where the white man's foot hath never passed,
And the quivered Coranna or Bechuan
Hath rarely crossed with his roving clan,—
A region of emptiness, howling and drear,
Which man hath abandoned from famine and fear.

. . . . . .

Where grass, nor herb, nor shrub takes root,
Save poisonous thorns that pierce the foot;
Where sedgy pool, nor bubbling fount,
Nor tree, nor cloud, nor misty mount,
Appears, to refresh the aching eye;
But the barren earth and the burning sky,
And the blank horizon, round and round,
Spread,—void of living sight or sound.
And here, while the night winds round me sigh
And the stars burn bright in the midnight sky
As I sit apart by the desert stone,
Like Elijah at Horeb's cave, alone,
"A still small voice" comes through the wild
(Like a father consoling his fretful child),
Which banishes bitterness, wrath, and fear,
Saying,—Man is distant, but God is near!

IF *

Here Rudyard Kipling speaks in one of the finest poems. A British general was talking about the World War. He went through all its dark hours, and there were days when it seemed that life could never be worth living again. At such times he took out of his pocket a crumpled-up copy of If. He read it again and again, and life became a new thing. He sent for hundreds of copies, and whenever he found a soldier in despair he gave him a copy of If.

IF you can keep your head when all about you
Are losing theirs and blaming it on you;
If you can trust yourself when all men doubt you,
But make allowance for their doubting too:
If you can wait and not be tired by waiting,
Or being lied about, don't deal in lies,
Or being hated don't give way to hating,
And yet don't look too good, nor talk too wise;

If you can dream—and not make dreams your master;
If you can think—and not make thoughts your aim,
If you can meet with Triumph and Disaster
And treat those two impostors just the same;
If you can bear to hear the truth you've spoken
Twisted by knaves to make a trap for fools,
Or watch the things you gave your life to, broken,
And stoop and build 'em up with worn-out tools;

If you can make one heap of all your winnings
And risk it in one turn of pitch-and-toss,
And lose, and start again at your beginnings
And never breathe a word about your loss:
If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the Will which says to them: "Hold on!"

If you can talk with crowds and keep your virtue,
Or walk with Kings—nor lose the common touch,
If neither foes nor loving friends can hurt you,
If all men count with you, but none too much:
If you can fill the unforgiving minute
With sixty seconds' worth of distance run,
Yours is the Earth and everything that's in it,
And—which is more—you'll be a Man, my son!

SO LIVE

This happily turned epigram, linking up a whole lifetime, is by Sir William Jones, who lived from 1746 to 1794.

ON parent knees, a naked new-born child,
Weeping thou sat'st while all around thee smiled:
So live, that, sinking to thy life's last sleep,
Calm thou may'st smile, while all around thee weep.

*Taken from Rewards and Fairies, copyright, 1910, by Rudyard Kipling.

WHAT CAN A LITTLE CHAP DO?

The writer of this admirable poem for boys, John Oxenham, has put much stimulating thought and advice into his verse, but he has never succeeded better than in this fine, plain, and truly helpful outline of the ideal boyhood.

WHAT can a little chap do
For his country and for you?
What can a little chap do?

He can play a straight game all through;
That's one good thing he can do.

He can fight like a Knight
For the Truth and the Right;
That's another good thing he can do.

He can shun all that's mean,
He can keep himself clean,
Both without and within;
That's a very fine thing he can do.

His soul he can brace
Against everything base,
And the trace will be seen
All his life in his face;
That's an excellent thing he can do.

He can look to the Light,
He can keep his thought white,
He can fight the great fight,
He can do with his might
What is good in God's sight;
Those are truly great things he can do.

Though his years be but few,
If he keep himself true
He can march in the queue
Of the Good and the Great,
Who battled with fate
And won through;
That's a wonderful thing he can do.

And in each little thing
He can follow the King;
Yes, in each smallest thing
He can follow the King,
He can follow the Christ, the King.

THE COUNTRY FAITH *

"God made the country, man the town," said an eighteenth-century poet, and in these sweet lines the modern poet Norman Gale tells how the country naturally suggests thoughts of God and creates in men a trustful spirit.

HERE in the country's heart,
Where the grass is green,
Life is the same sweet life
As it e'er hath been.

Trust in a God still lives,
And the bell at morn
Floats with a thought of God
O'er the rising corn.

God comes down in the rain,
And the crop grows tall—
This is the country faith,
And the best of all!

*Reprinted from collected poems by Norman Gale. Copyright, Macmillan & Co., Ltd.

THE WALRUS AND THE CARPENTER

BY LEWIS CARROLL

THE sun was shining on the sea,
Shining with all his might;
He did his very best to make
The billows smooth and bright—
And this was odd, because it was
The middle of the night.

The moon was shining sulkily,
Because she thought the sun
Had got no business to be there
After the day was done—
"It's very rude of him," she said,
"To come and spoil the fun!"

The sea was wet as wet could be,
The sands were dry as dry.
You could not see a cloud because
No cloud was in the sky;
No birds were flying overhead—
There were no birds to fly.

The Walrus and the Carpenter
Were walking close at hand;
They wept like anything to see
Such quantities of sand:
"If this were only cleared away,"
They said, "it *would* be grand!"

"If seven maids with seven mops
Swept it for half a year,
Do you suppose," the Walrus said,
"That they could get it clear?"
"I doubt it," said the Carpenter,
And shed a bitter tear.

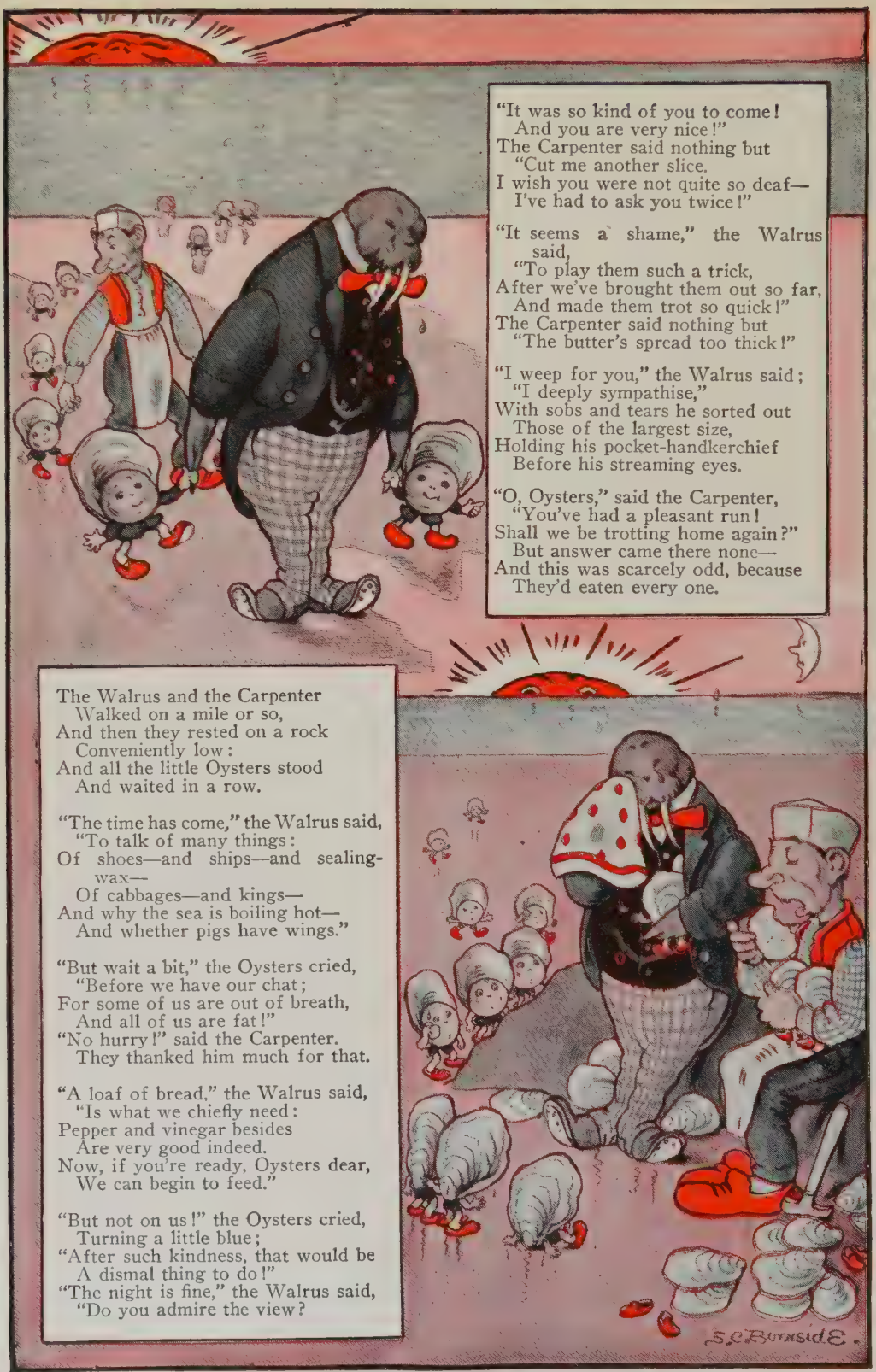
"O, Oysters, come and walk with us!"
The Walrus did beseech.
"A pleasant walk, a pleasant talk,
Along the briny beach:
We cannot do with more than four,
To give a hand to each."

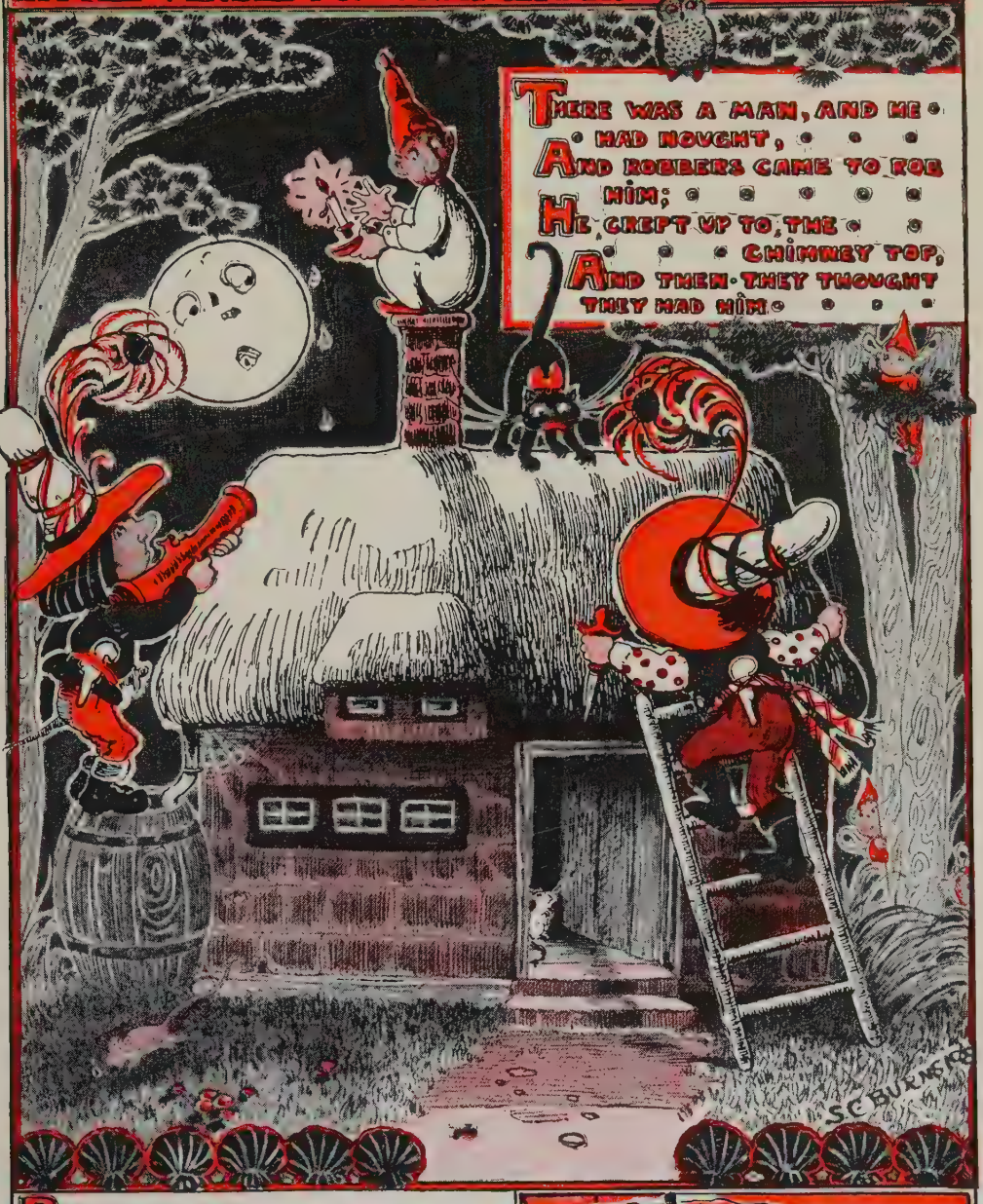
The eldest Oyster looked at him,
But never a word he said:
The eldest Oyster winked his eye,
And shook his heavy head—
Meaning to say he did not choose
To leave his oyster-bed.

But four young Oysters hurried up,
All eager for the treat:
Their coats were brushed, their faces washed,
Their shoes were clean and neat—
And this was odd, because, you know,
They hadn't any feet.

Four other Oysters followed them,
And yet another four;
And thick and fast they came at last,
And more, and more, and more—
All hopping through the frothy waves,
And scrambling to the shore.

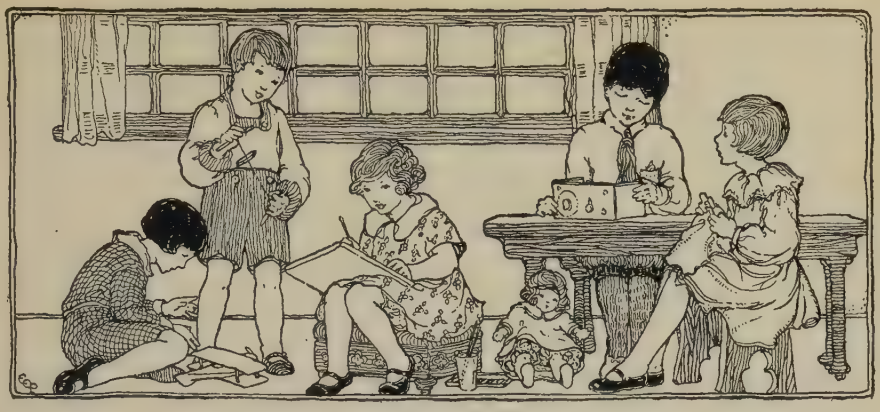
S. G. BURNSIDE


The Walrus and the Carpenter
Walked on a mile or so,
And then they rested on a rock
Conveniently low:
And all the little Oysters stood
And waited in a row.
"The time has come," the Walrus said,
"To talk of many things:
Of shoes—and ships—and sealing-wax—
Of cabbages—and kings—
And why the sea is boiling hot—
And whether pigs have wings."
"But wait a bit," the Oysters cried,
"Before we have our chat;
For some of us are out of breath,
And all of us are fat!"
"No hurry!" said the Carpenter.
They thanked him much for that.
"A loaf of bread," the Walrus said,
"Is what we chiefly need:
Pepper and vinegar besides
Are very good indeed.
Now, if you're ready, Oysters dear,
We can begin to feed."
"But not on us!" the Oysters cried,
Turning a little blue;
"After such kindness, that would be
A dismal thing to do!"
"The night is fine," the Walrus said,
"Do you admire the view?
"It was so kind of you to come!
And you are very nice!"
The Carpenter said nothing but
"Cut me another slice.
I wish you were not quite so deaf—
I've had to ask you twice!"
"It seems a shame," the Walrus said,
"To play them such a trick,
After we've brought them out so far,
And made them trot so quick!"
The Carpenter said nothing but
"The butter's spread too thick!"
"I weep for you," the Walrus said;
"I deeply sympathise,"
With sobs and tears he sorted out
Those of the largest size,
Holding his pocket-handkerchief
Before his streaming eyes.
"O, Oysters," said the Carpenter,
"You've had a pleasant run!
Shall we be trotting home again?"
But answer came there none—
And this was scarcely odd, because
They'd eaten every one.
S. L. Bensusan.



BUT HE GOT DOWN ON
T'OTHER SIDE,
AND THEN THEY COULD NOT
FIND HIM,
HE RAN FOURTEEN MILES
IN FIFTEEN DAYS,
AND NEVER LOOKED
BEHIND HIM.

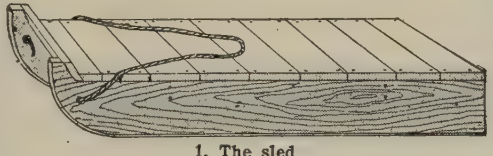
HERE'S A POOR WIDOW FROM BABYLON
WITH SIX POOR CHILDREN ALL ALONE ;
ONE CAN BAKE AND ONE CAN BREW,
ONE CAN SHAPE, AND ONE CAN SEW.
ONE CAN SIT BY THE FIRE AND SPIN ,
ONE CAN BAKE A CAKE FOR A KING.
COME CHOOSE YOU EAST, . . .
. . . COME CHOOSE YOU WEST,
COME CHOOSE YOU THE ONE .
. THAT YOU LOVE THE BEST.



MAKING A SLED

CONTINUED FROM 1776

A TOBOGGAN is a particular sled which affords boundless delight and healthy exercise to children who live in lands where snow is as common as it is in our Northern winter. And we should find a toboggan a source of immense pleasure where and when we have one of the old-fashioned Christmas-card sort of winters, with its heavy snowdrifts, and soft, clean snow lying several inches thick in the meadows and lanes, but particularly on the steep slopes, for it is there that children can most safely use the toboggan. Toboggans were first made from curved birch-bark by the North American Indians.



1. The sled.

There are several kinds of sleds. One is made of iron or steel like a sleigh; the other sort is made of pieces of board nailed together. This latter kind is very easily made, and we shall make one of them. Toboggans are good when the snow is quite soft; but it soon hardens as we glide down a few times, and we shall find the sled to be very satisfactory.

2. The sled gliding downhill.

To make one we must first get two pieces of board about 4 feet long, 6 inches wide and 1 inch thick. These we must cut to form the two sides, as shown in picture 1. Now we must get some more wood and cut it into lengths of 20 inches. This wood should not be more than ½ inch in thickness. As each piece is cut it should be nailed to the long pieces in the way shown in picture 1. The piece in front may be a little narrower than the others, as it is fixed to the turned-up part. If we look carefully at picture 1 we will see two pairs of nails on the side, a little way below two of the top boards. These nails hold in position two pieces of wood stretching from side to side so as to strengthen the sides. Any boy could make a simple sled like this in one afternoon. Probably the wood could be used from old boxes, but if not, a carpenter would sell all that is necessary for a few cents and also cut the pieces properly.

The best way to show how to use the sled is to tell how it is used by the "Children of the Snow," as we may call the boys and

girls in Switzerland, Norway and some parts of Canada, where such a sled is an article of everyday play in winter time. Every child has one of them. A merry party goes to where there is a good long, steep slope covered with snow. Then, one after another, the children sit upon their own sleds, and starting at the top of the slope, let them slide right down to the bottom, guiding them meantime by touching the snow with their feet. When the sleds stop at the bottom, the children walk up the slope again. Sometimes several sleds are made into one long file. One boy, generally the oldest, goes first. He sits or lies on his sled; then another boy gets on his sled and puts it close behind the first. He stretches out his legs so that the leader can hold his ankles. All the others do the same in turn, till there is a string of children on their sleds. From a little distance the long line looks like a big black snake. When they are all ready, the first boy shouts to them all to hold on tight, and then he lifts up his feet and away they all go. The long line winds to right and left down the steep snow-road, and sometimes it goes faster than any train.

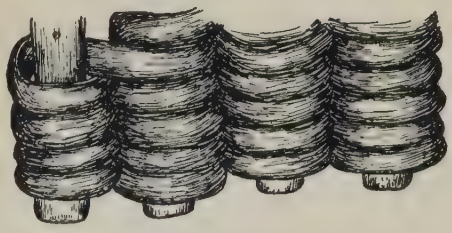
If any let go and fall off they are left behind in a moment, for the line of sleds goes at such a rate that it cannot be stopped easily. Sometimes the children who fall off go plump into the soft snow and are quite buried in it, but in a few seconds they struggle out again laughing. Sometimes the whole line of swift sleds will upset, and then you see twenty or thirty children and their sleds mixed up together, and laughing so much that they cannot get on their feet again. They never get hurt, for the snow is so soft that when they tumble it is just like falling into a feather bed.

It is all fun, and they love it. The "Children of the Snow" would not like to live in countries that have no real winters. They would not like warm winters at all. But even in the warmer countries there sometimes is snow on the ground for a little while. So, if we feel envious of the fun the Snow Children have, we ought to make a sled and so be ready for the first chance that comes to try these jolly winter frolics of the colder lands.

To enjoy the sliding and to be free from any danger of taking cold, we must wear warm clothing and thick mittens.

A RAFFIA-COVERED RATTAN BASKET

AFTER deciding upon the use which you will make of this basket, an outline pattern is made of the shape and size decided upon by folding and cutting a piece of heavy paper as planned. This is then transferred to drawing paper and, if desired, a suitable design may be colored either with crayons or with water



Method of making over-and-under, or figure-eight, stitch.

colors. It is well to choose a simple but rich pattern.

In making a basket from reed or rattan and raffia it is possible to use any one of several stitches. However, one which makes a very firm basket is the figure-eight stitch, so called because the raffia makes this figure as it passes in and out in the process of sewing. This basket is formed by coiling a piece of rattan, covering it with raffia and at the same time sewing it to itself as the process of coiling develops. After the rattan has been thoroughly soaked, one end is first bent to the form of a hook, after which plain raffia is wrapped about it and the coiled-sewing begins as shown. A large blunt-pointed needle (fine tapestry) is best suited for sewing with the raffia. The raffia is split, in order that the sewing may be aided, and is always used when dry. The figure-eight is merely an over-and-under stitch,

Hook-formed end wrapped with raffia for coiled-sewing.

as shown in the drawings. The needle goes between reeds and into basket, then around outside reed and into basket, and finally around inside reed and out of basket. As this is repeated again and again the coils gradually form the bottom of the basket and are then turned up to shape the sides as planned. In case it is decided to use a border design, the colored raffia can be inserted at intervals as it is needed to give the desired effect. If more than one color of raffia is used, it will be found convenient to have a separate needle for each color.

FILLING A DOLL'S CHRISTMAS BASKET

WHAT are the things we should like to pack in the doll's Christmas basket, if only we could get them small enough to go in? It would be delightful to be able to put in a tiny turkey and a brown ham, also a Christmas cake, a plum-pudding, and last, but not least, some fruit—some beautiful golden oranges from Florida or California, bananas from the West Indies, and some fine British Columbia apples.

However, as we cannot get all these delightful things by wishing for them, the next best thing is to try to make them ourselves. But how can we?

There is a delightfully simple way of doing this. From a piece of clay, which we can buy from any dealer in artists' materials, we can model our things and afterward paint them the exact shades to represent the various articles. If we cannot get this clay we need not despair, for we can make our own modeling material from flour and water, which we must mix into a stiff dough and knead until it is quite firm and clean and does not stick to our hands. If we use clay, there are just one or two things which we must remember. The more clay is handled and worked, the more plastic it becomes. Fresh clay easily breaks, and cannot be modeled so well or worked with the same freedom as well-used clay. Clay that is kept in good condition will not stick to our fingers, and we shall find it a clean and pleasant material to work with.

The things for the basket.

If our clay should become hard and dry, we must break it up into little pieces, sprinkle it slightly with water, and wrap it up in a wet cloth until it becomes soft again.

Whenever we have finished with our clay and wish to put it away for a time, if we are wise we shall wrap it in a wet cloth squeezed (not wrung) out of cold water.

When we have obtained our clay or dough for the modeling of our articles, an old slate and our box of paints are the only other things required.

We must be careful to make all the things in proportionate sizes: they would not look at all real if we made an orange as big as a turkey! We must take a piece of clay as large as a big walnut for the boiled ham, a piece rather smaller for the turkey, one-half the size for our plum-pudding and Christmas cake, and several pieces as large as big peas for the oranges, apples and bananas.

First we will make the orange, because it is the simplest of them all. Just at this point it will be as well to remember that the things made of clay will dry and harden ready for painting if left for a few hours on the slate. If made of dough they must be put into a cool oven or before the fire until they become quite hard.

When we try to model the various things we shall be astonished to find how little we really know about them, so it will be well to have a real orange, apple or banana to work from. To form an orange we must work the piece of clay between our finger and thumb until it assumes a perfectly round shape, very, very slightly flattened on one side. Prick it all over with the point of a wool needle which has a round or blunt point, to represent the pores found in the skin of an orange. When it is dry, paint it with *chrome orange*.

To make our apple we proceed in exactly the same way, but we must slightly flatten the ball at top and bottom, and with a pointed match-stick hollow out a tiny groove round the eye and another at the base, where we insert a tiny twig to represent the stalk.

We touch the eye of the apple with black paint, and paint all the rest of the apple green. Use *olive-green* with a touch of pale *chrome yellow* or, for a red-cheeked apple, give a touch of *crimson lake* on one side, gradually merged into the green.

To make the pudding we take a piece of clay as large as a nutmeg and make it round like a marble. We cut a small square of white muslin and tie it up while it is still soft. Finally, we must give the cloth a few dabs of brown paint to represent stains from the pudding inside it.

Our Christmas cake requires the same amount of clay as the pudding. We roll it into a ball, press out cylinder shape, and flatten one end on the slate. With a pointed match-stick we make the top rough, to give it the appearance of a plum-cake. Then we paint it a good brown, using *Vandyke brown* paint and *chrome orange* in equal proportions. Afterward tiny black dots are used all over to represent currants.

A fine banana is formed from a little cylinder of clay. We press three pointed edges up along the cylinder, curve it slightly and bring one end to a point. To color the banana, pale *chrome yellow* is used with little touches of brown here and there, as in a real banana that is quite ripe.

We must shape our ham from a piece of clay the size of a large walnut by first making a ball, which we gradually press on the slate to flatten the under-side. At the same time we must nicely curve the upper side with the fingers and draw out the bone at the end. As our ham is supposed to be ready cooked and

glazed for the table, we must paint it a rich brown, using *brown madder* paint for the purpose.

An excellent tongue can be formed from a piece of clay about one-third the size of the ham. It should be shaped as shown in the picture on the preceding page and colored the same shade as the ham.

Last comes the turkey, made from a piece of clay about the size of a small walnut, from which, first of all, we model two small legs, as in picture 2, and the two little flat pieces for the wings. The rest of the clay we roll into the shape of a cylinder; we must flatten one side, and with our fingers draw up the top to represent the breast-bone of the bird. Press the legs and wings into place, as in picture 2, and finally we must paint the whole a pale brown, using *chrome orange* with a dash of *Vandyke brown* paint. Last, but not by any means the least, we wrap up daintily each article in a square of white tissue-paper or cotton batting, remembering that the common things of life may always be made more beautiful with the exercise of a little care and taste in their arrangement.

If we pack our basket properly, the things will travel safely to their destination. We must place our ham at the bottom, as it is by far the heaviest article; after that the turkey and tongue side by side, putting little pads of cotton batting in the hollow places so that the legs of the turkey do not get broken. Above these come the pudding and the cake, and last of all we put in the fruit, of which we must make sufficient to fill up all the empty space, and our little Christmas basket is then quite complete. It must now be wrapped and tied strongly, ready for posting.

The little friend who receives the basket will be able to dish up the various articles on the tiny dishes of a doll's tea or dinner service and have delightful times playing at dolls' parties, shops and restaurants.

THOUGHT-READING BY CARDS

THIS is a trick that needs the assistance of an accomplice. Some cards—six, or nine, or twelve, or as many as you like—are spread out, face upward, on a table.

1. A row of cards before touching.

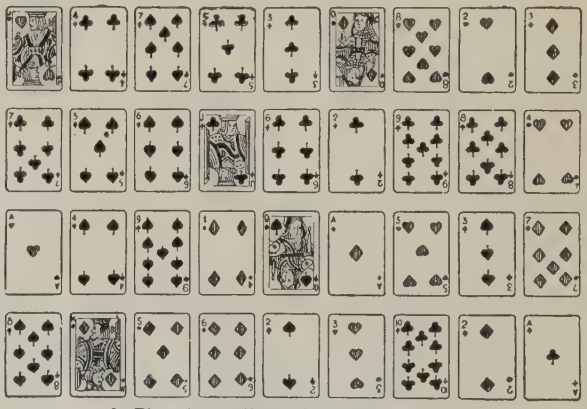
The thought-reader goes out of the room, and the accomplice, or stage manager, as we shall call him, says: "Will anyone please pick up a card, any card, and hand it to me?"

2. The same row of cards after being touched.

Someone does so and the stage manager puts it down again in the same place. The thought-reader comes into the room, and by merely looking at the cards he knows which card has been lifted and replaced. But he need not say so right away. He can go up to any one of the company, and after saying, "Think of the name of the card that has been touched," he holds his or her hands or head and then says what card it was.

How does he know? Easily enough. The cards must be of the kind that have a line round each, outside the spots or picture. Many cards are of this variety. They are always cut so as to leave a wider margin at one end than at the other. As the cards are spread out on the table in the first instance, all the broad margins are put facing one way. When the accomplice replaces the card, he puts it back with the narrow margin at the end where the broad margin was before, and the conjurer sees by merely looking at them which card has been taken and put back. Picture 1 shows a number of cards as they would be before being touched, and picture 2 shows the same cards after the conjurer comes into the room. It is plain that the three of clubs is the selected card. This trick is impressive because the accomplice says not a word and makes not a sign. Indeed, he may be sent out of the room or behind a screen before the conjurer comes into the room.

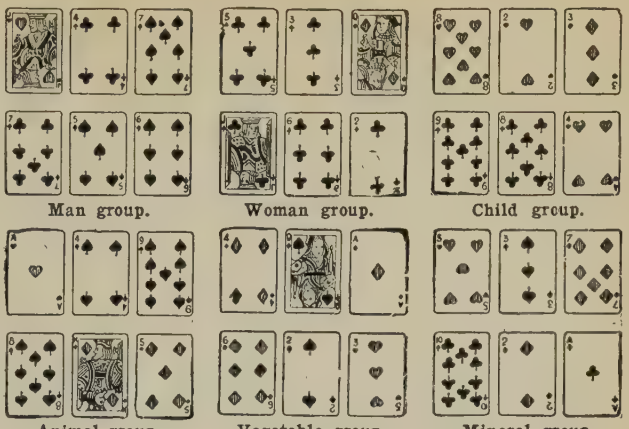
Another thought-reading card trick is very clever and very puzzling. Thirty-six cards are used, and again there is both a conjurer and an accomplice. The cards are spread out in four rows, with nine cards in each row, as seen in picture 3. The conjurer goes out of the room and someone touches a card. Then when he comes back the accomplice says something like this: "Uncle



3. Thought-reading with thirty-six cards.

William likes green peas," or "Little Mary Smith lost her needle." These words indicate what card has been touched. This is a trick that may be repeated as often as you like; the more often it is done the more puzzling it becomes, and it is practically impossible to find the key for it.

What is the key or secret code used by the performers? They must suppose that the cards are divided into six groups of six cards, as indicated in picture 4. Then the names of the groups take the following order—man, woman, child, animal, vegetable, mineral. Picture 4 indicates the order of the groups. Then it is supposed that each group is divided in the same way, so that in each group there is a man card, a woman card, a child card, an animal card, a vegetable card and a mineral card. Picture 5 indicates the name of the cards in each group. The sentence spoken by the accomplice must contain two nouns, the first noun indicating the group and the second noun indicating the card in the group. Thus "Uncle William likes green peas" means man group, vegetable card, so that the card touched will be the second from the left hand in the second row from the back. "Little Mary Smith lost her needle" is the explanatory sentence and it means child group and mineral card, so that in this case the card touched was the card at the extreme right of the second row from the back. "Our donkey loves baby" means animal group and child card, so that the card this time is the one third from the left of the second row from the front. Very little practice will give skill in this trick, which is one of the best for evening parties, as people ask for it to be repeated again and again, hoping that they may at last be so clever as to find out the secret. But this they rarely do unless the trick is clumsily done.

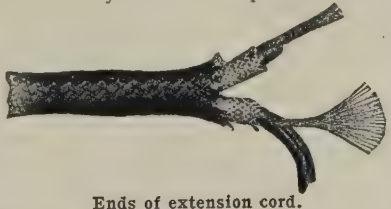


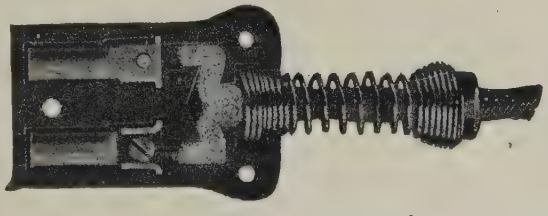
4. Division of the cards into groups.

5. Division of a group.

HOW TO REPAIR AN EXTENSION CORD

BOTH time and expense can often be saved if you are able to repair the extension cord used on an electric flatiron or any other similar electrical appliance. For example, it is found that the constant use of the flatiron wears the insulation off the cord at the place where it enters the attachment. If this is not repaired before it is used again, inconvenience due to a short circuit may result. In case the cord is badly worn, it should be replaced with a new one; however, the use of tape often makes it possible to mend a worn place so that the cord will give satisfactory service for some time.


Ends of extension cord.

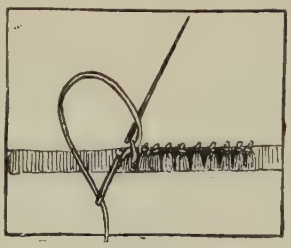

Attachment with cover removed.

If the cord is in good condition with the exception of the worn insulation where the cord enters the attachment, the damaged ends may be cut off and new ones may be scraped as shown in the drawing of a portion of the flexible cord, before these are attached to the binding-posts. The directions for doing this are easily followed. First remove the cover from the attachment, as shown in the picture, in order to take the wires from the binding-posts. Next cut off the damaged ends of wire and clean the new ones which are to be attached. Any damaged portions of the cord should be wrapped with tape. Now fasten ends under the binding-posts as you found them, being certain that all of the fine wires are held well. Then assemble the attachment and try it out.

A DAINTY AFTERNOON TEA-CLOTH

LET us see what we need to make the charming little drawn-thread-work tea-cloth illustrated on the next page. We need a piece of linen, about a yard square—not too fine, as the finer it is the more difficult it will be to work—and a skein or two of the Teneriffe cotton especially made for this kind of work, which can be bought at any needlework shop.

The first thing to do is to measure the hem. A fairly wide one is necessary, so we will allow 6¼ inches. The ¼ inch is for the little piece to turn in, and the 6 inches, doubled into two, will give us a hem of exactly 3 inches. When we have measured our hem we cannot turn and tuck as in ordinary work, for our corners must be left loose to draw the thread, but we mark the size of the hem by drawing one thread exactly where we shall sew the hem later on. As a matter of fact, we need more than one thread for the hem, but in all drawn-thread work, the insertions are worked first, and this is what we will proceed to do.

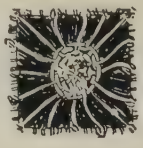


1. Hemstitching.

The insertion as shown in the picture is really the very easiest work that can be devised, and it can be done by any child who is able to sew well. We begin by removing, in one direction only, as many threads as necessary. This, of course, leaves nothing but loose strands, and it is the uniting of these into clusters which is called drawn-thread work.

2. Single crossing.

First of all, however, it is necessary to measure the space which must be left between the hem and where the insertion is to be. Especially must this be done if it is desired to work a fine feather-stitching, as shown in picture 5, which will greatly increase the value of the work. This fancy featherstitching has great ornamental value.



3. A corner.

4. Knot-stitching.

Once the space has been decided upon, draw a thread very lightly on each side at the given point. If we want our cloth to be perfectly square, we must take the trouble to count our threads. If the linen chosen is coarse enough, this will surely give very little trouble.

This one thread drawn on each side will form at the four corners where they meet a little pinprick of a hole. This is to be a little empty square, which we will later transform into a pretty wheel. For the moment we will use it as a landmark, and inserting the point of some sharp scissors, we will cut the linen very straight, following the woven threads for two sides of the corner—that is, 1 inch on each side of the pinhole.

We must repeat this at each corner. Now, to prevent these cut threads from becoming loose on the sides of the material forming the corner, we will immediately work a loose buttonhole stitch, as shown on page 339. This will save a considerable amount of trouble, and will keep the work neat and tidy.

Now comes the most fascinating part—the drawing of the threads. By fraying out the cut part which faces our buttonholed edge, we shall have just enough hold on the threads to draw them out easily. We must not try to draw out several threads at once, for the weaving is done in threads which cross each other, and if we pull two at the same time they will press one on the other, so keeping each other in place. All the long threads being drawn out along the one-inch cut will leave us a band of loose upright threads, and on these threads we will set to work.

For a beginner few patterns are really simpler than the one which is known as single crossing. For single crossing, count the strands—that is, each lot of upright threads to be taken up with the needle—in sets of 5. Two sets are necessary for each pattern. Now we must thread our needles with a long thread, and start in the middle of the buttonholed edge at the extreme corner of the band of loose strands, as in picture 2. We bring the needle down over two sets, back up under the lower and over the upper of these sets; then go down again behind the upper and lower sets, and out below them. The thread is now drawn up, and the two sets crossed. If we repeat all along, our work will look like the insertion in picture 5.

A very useful stitch in the drawn-thread work is knot-stitching, so called because the thread is formed into a knot. This knot is a kind of chain-stitch, made by bringing the threaded needle out on the right side of the work at the top of the material, then bringing the thread down across the loose strands of the material and up again to the right. This forms a loop which is held down at the bottom by the left thumb. Next the needle is inserted to the left of the thread and under the strands to be inclosed, then through the loop, thus forming a knot to be drawn tight, by moving the thumb and pulling the working thread through. This knot-stitch is used more than any other in hemming drawn-thread work, and is the one shown in picture 4 on this page.

When the insertion, as already explained

above, has been done all round, turn in the edge of the material, fold the hem down in the usual way with the ¼ inch inside, and tuck it neatly all round, exactly along the line of the first drawn thread. The corners must be turned very carefully, otherwise they will feel thick. The open ends will have to be sewn over in little fine over-stitches. Now, we cannot work a hemstitch without more threads being drawn, so we will again use the point of the sharp scissors and cut as many threads on each side as will be necessary to make a suitable hem—about four or five threads will be sufficient.

Hemstitching is shown in picture 1. This is how the stitch is worked. Thread a needle with a long piece of cotton, and fasten it to the upper edge of the loose strands, at the right-hand end of them, by taking a couple of stitches, and bring the needle out three threads above the loose strands and threads. Insert the needle into the loose strands, exactly under the place where it last came out, and take three strands upon it from right to left, keeping the cotton under the needle. Draw out the needle; insert it again where it last came out. This time bring it out three threads above the loose strands, to the left, taking up exactly the same three strands as before.

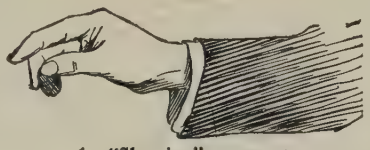
5. Tea-cloth trimmed by drawn-thread work.

But what about the corners? When bands of openwork are carried along two sides of a piece of work, a space, or "open square," is formed in the corner where the lines of work meet. In ordinary hemstitching this space is so small that it may be passed over. Where more strands are drawn a filling is necessary, and this usually takes the form of some such wheel as shown in picture 3.

The foundation strands, or spokes of these, are the continuations of the working threads that have been used along the single crossing insertion. Two or more threads are then put right across from corner to corner, and the wheel is worked from the centre. The needle has to be taken alternately over and under one of these spokes, formed by the crossing threads, close round the centre until this has been surrounded four or five times. The needle is linked through the last round of the thread, between the spokes, and the thread is taken across to the vacant corner, where it is fastened off.

THE DISAPPEARING PENNY

A LITTLE practice enables a boy to mystify others with the trick of the disappearing penny. The conjurer offers someone a penny, and as the other opens his hand to receive it he also opens his hand (apparently), and the penny has fled. This is a mere trick of sleight-of-hand, and one needs practice to be able to do it properly. The conjurer must see that the sleeve of his coat hangs with as much space as possible below the wrist, and it is good also if the shirt sleeve or cuff come as far down as possible. Then he takes the penny between his thumb and middle finger, as shown in picture 1, at the same time raising his arm a little above the horizontal. As his friend opens his hand for the coin he snaps the two fingers, and the coin will disappear up his sleeve. He opens his hand and it is empty. Then as he lowers his arm by his side the penny falls down his sleeve into his hand again. When the young conjurer attempts this trick for the first time he will probably fail, but a half-hour's practice will give him skill, and eventually, if he is careful, he will be able to do it every time he tries.



1. "Sleeving" a penny.

2. How to catch the coins.

Taken by itself, this trick may not seem very much, but it is very effective if introduced among some other tricks. The look of innocent surprise that usually comes upon the face of the poor boy who expected to receive the penny is generally very amusing indeed.

Yet another sleight-of-hand trick with coins is rather clever, and not nearly so difficult to perform as it looks. The boy puts upon his sleeve, as shown in picture 2, a number of pennies or nickels, or some of each, up to as many as six in all. Then, by simply bringing his arm down quickly while he holds his hand open, with the fingers slightly bent, all the coins go safely into his hand. It seems as if they ought to go scattered in all directions. A very little practice gives proficiency in this trick. Practice should be with a wall in front, so that in case of failure the coins will not go into places where they cannot be easily recovered or do some damage or even hurt a spectator. Of course these are only meant to be tricks.

HOW TO TELL SIMILAR WOODS APART

IN making furniture cabinets or other constructions it is sometimes difficult to distinguish woods which closely resemble one another in general appearance. The following information and a little practice should make it possible for you to select these woods with a fair degree of certainty.

Birch, Beech and Maple. Birch, beech and maple are very similar in appearance, and have approximately the same weight. Hence it is comparatively easy to mistake one of them for another. A method which anyone can use to distinguish them is suggested by the United States Forest Products Laboratory. The method makes use of the relative width of the pores and medullary rays in the three woods.

If the end grain of birch, beech or maple is cut smooth with a sharp knife and examined with a hand lens, the pores will be seen as tiny holes distributed fairly evenly over the surface. The medullary rays will appear as narrow lines of a different shade running at right angles to the growth rings. In beech, some of the rays are very distinct even without a lens. The large rays are fully twice as wide as the largest pores. In maple, the rays are less distinct, and the largest are about the same width as the largest pores. In birch, the rays are very fine, invisible without a lens. The pores are several times larger than the rays, usually being visible to the unaided eye as minute holes on the end grain and as fine grooves on dressed faces of the board. The pores in birch are larger than the pores in beech or maple.

The appearance of the medullary rays on a "quartered" surface is also distinctive. Here they appear in beech as distinct "flakes," the largest being between 1/16 and 1/8 inch in height when measured along the grain of the wood. In maple they are considerably smaller, rarely attaining a height of 1/16 inch. In birch they are comparatively inconspicuous.

Mahogany, Walnut and Red Gum. In the manufacture of furniture and cabinets a great deal of red gum is used as an imitation of mahogany or Circassian walnut. When red gum is properly finished it can be made to look so much like either of these woods that only by careful observation can the true be distinguished from the substitute. There is a very distinct difference, however, between red gum and mahogany or walnut. This difference lies in the size of the pores.

In mahogany, Circassian walnut and black walnut the pores are so large that they can be seen very distinctly on a smoothly cut surface of the end grain, where they appear as minute openings smaller than pinholes but visible without magnification. On surfaced faces the pores appear as fine grooves running parallel with the grain. They are even visible through the varnish, appearing as dark lines. In red gum the pores are much smaller and can be seen only with a magnifying glass.

Only true mahogany from tropical America, "African mahogany" and "Philippine mahogany" are commonly sold as mahogany in this country, but at various times more than sixty different species of timber have been sold under that name. Although all of these species resemble each other in varying degrees, tropical American mahogany and "African mahogany" possess one important characteristic in common, which is helpful in their identification. This is the occurrence of dark amber-colored gum in many of the pores. The gum does not fill the pores but is recognized as dark specks or streaks in the pores as seen on smoothly cut end or side grain. It is barely visible to the naked eye, but is easily seen through a hand lens with a magnification of 10-15 diameters.

Some other woods have similar dark masses of gum in the pores, but none of these is commonly substituted for mahogany. Among them are crabwood and sapeli—species imported from South America and Africa in small quantities only—and the Cedrelas (Spanish cedar, etc.), which are rarely sold as mahoganies and are easily recognized by their odor.

True mahogany has fine, continuous, concentric lines on the cross section, usually from 1.8 to 1.2 inch apart, which distinguish it from "African mahogany," in which these lines are practically absent.

"Philippine mahogany" has none of the dark masses of gum in its pores. On smoothly cut end surfaces it shows more or less broken tangential lines from 1/8 inch to several inches apart, readily visible to the naked eye, and appearing under a lens as rows of small openings filled with a white substance.

A more complete differentiation of mahogany and so-called mahogany, describing the common species in detail, may be found in United States Department of Agriculture Bulletin No. 1050, "The Identification of True Mahogany, Certain So-called Mahoganies, and Some Common Substitutes."

HOW FAST DO YOU WALK?

THERE is a very simple way of telling at what speed one walks. Take a piece of thin string, say, 80 or 100 yards long. To one end tie a weight—a piece of lead or other metal, or even a stone. At a point 44 feet from the weight put a knot or a loop. Then put a second knot or loop 44 feet from the first, and so on along the entire length of the string.

Take in one hand a watch with a second hand. Now drop the weight upon the ground, and walk along at an ordinary pace, letting the weight remain where it fell and allowing the knots or loops to slip through one hand. The number of knots or loops that pass through the hand in half a minute are the same as the number of miles walked in an hour.

It is always well to know the reason for what we do. It is not enough to know that the number of times we walk 44 feet in half a minute is the same as the number of miles we walk in an hour. We ought to know *why* it is so. The reason is that 44 feet is the 120th part of a mile, because a mile contains 5,280 feet, or 1,760 yards, and a half-minute is the 120th part of an hour. Therefore we are able to walk 120th of a mile just as many times in 120th of an hour as we can walk a mile in an hour.

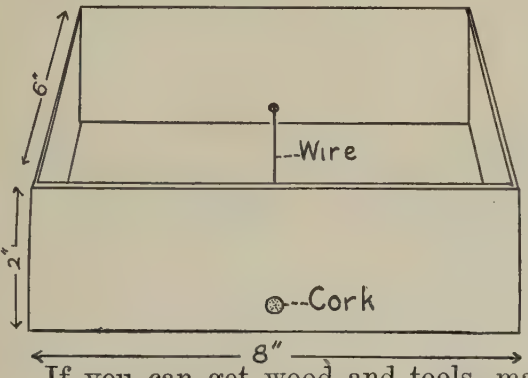
THE NEXT THINGS TO MAKE AND TO DO ARE ON PAGE 2163.

MORE WORTHWHILE GAMES

CONTINUED FROM 1897

MAKING A DICTIONARY
PLAYING SOUND GAMES WITH WORDS

WHEN the big boys and girls forget what a word means, they look in a dictionary. And if they come to a new word they don't know, they look in a dictionary. Where do you look for the words you forget? Your word cards tell you. Now you have so many word cards you can make them into a dictionary. A dictionary is a book that tells what words mean. You can make your dictionary out of cards, like those in the pictures on the next page.



If you can get wood and tools, make your own box. It will need to be eight inches wide to take your cards easily, for they are seven inches wide. Make it about six or eight inches long. I shouldn't make the sides over two inches high, for you want to see the pictures on the cards.

Now you want to put in the wire rod that holds the cards in the box. It runs from the middle of the front to the middle of the back of the box. It is half an inch up from the bottom. If your box is eight inches wide, half of that will be four inches. Bore your hole if you can. Or make a hole carefully with a

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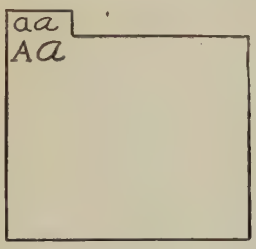
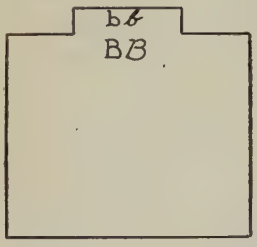
nail. Then run the wire through. Let the ends stick out and put a cork on each end to keep the wire from slipping out. Whenever you want to add some new cards to your dictionary you can slip off enough cards to put the new one in its place, and slip them back again without much trouble.

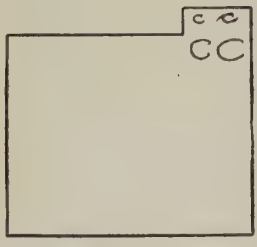
If you can't make a box, carry your measure around with you until you find a box that is the right size for a dictionary box, and fix the wire in it. If you use a pasteboard box, slip the box into the cover and use it double. It will be strong enough then to hold your cards.

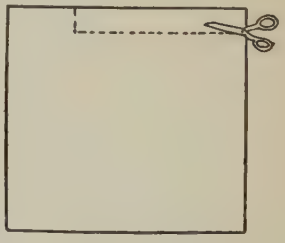


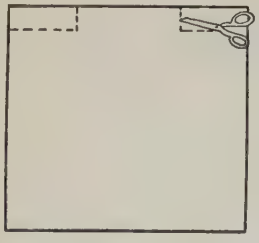
IN this picture you see some cards with letters on. These letter cards show you where your word cards belong. All the words that begin like boy and bear belong with the letter card that has b on it. If you put them in front of it, you can find them easily when you want them. These letter cards are blue. They are seven inches wide and six and a half inches tall. Cut nine of them, and nine more and nine more.



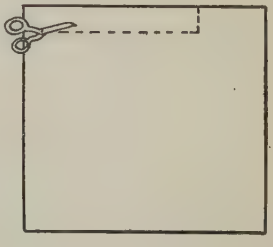
Make one pile of nine like this picture. Measure down one inch on each side of the card, make a mark and draw a line across the card. Measure over two inches from one edge, make a mark and draw a line. Cut off the card up to this line, as in the picture at the right. On these cards put the letters from page 40 of your Work Book that are like these: a d g j m p s v y.



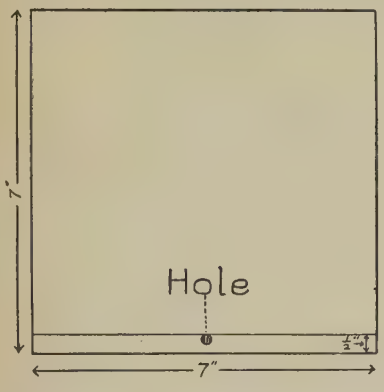




Measure the next nine cards the same way, but cut them as in the picture at the left. On them put the letters b e h k n q t w z from pages 40 and 41 of your Work Book.

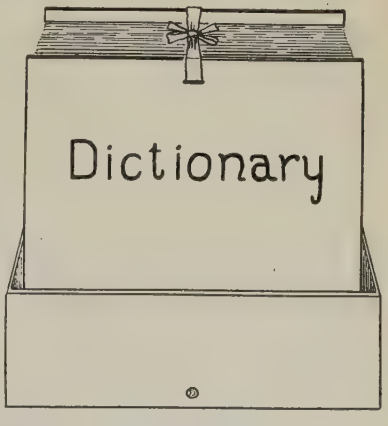


Then make eight more like the picture at the bottom corner of the previous page and on them put the letters c f i l o r u x. On the card you have left put the words Out of Place. That means, if you haven't time to put away a word just exactly where it belongs, don't hurry and slip it into a wrong place. Put it by the Out of Place card until you have time to find out just where it does belong. Then you will never have trouble with cards being mixed up.



If you have a piece of very light board or very heavy cardboard, cut two pieces seven inches wide and seven inches tall. Measure up half an inch from the bottom of one of the boards and draw a line. Put a mark in the middle of this line and bore a hole there just under the line, so the top of the hole comes to the line. You can bore the hole in both boards at the same time. These boards are to put at the front and back of your dictionary to keep the cards all standing up straight. You can fasten some tapes to the top and tie the two boards together when you are not using the dictionary. The picture here shows how your dictionary will look when the boards are tied up neatly together.

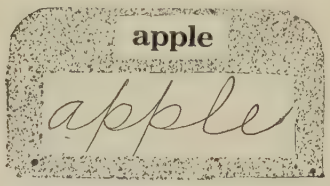
Before you put the wooden pieces in the box, use them to mark your cards, so you can punch them all alike. Lay one of them on each letter card, edges close together, and stick your pencil point into the hole and make a little mark on your card. This mark tells you where to punch your card. Punch each card that way, so you can put the wire through. Put a strong linen eyelet over each hole.



Now these are all ready for the dictionary box. First put the a card, then the b, then c d e f g h i j k l m n o p q r s t u v w x y z and Out of Place.

YOUR word cards have the word on one side and the picture on the other side.

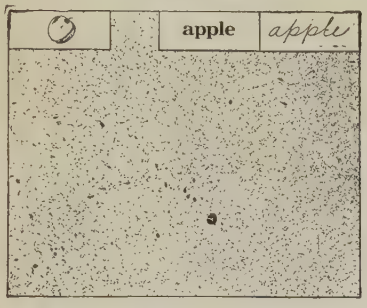
Front of Word Card



Back of Word Card

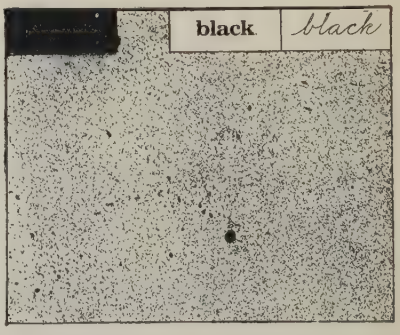
But now look at the card below. How is this card different? Yes, it has the picture on the front with the words. And it is taller. It is five and a half inches tall. It has a hole punched in the bottom. I will tell you still another difference that doesn't show in the picture. This card is tan-colored and the other word cards are gray.

File Card



And this is the reason why it is different. It is made so it can tell you all about the word the minute you look at it. So it has the words and the picture all on the same side. It has them up at the top of the card so you can see them as you turn the cards in the dictionary box without taking them out. It has the hole punched in the bottom so the wire will hold it in place in the dictionary box.

You may call these cards file cards because you file them on the wire one after another in the right place. You can tell which is the right place because you know all the words that begin alike belong together. You can make one of these file cards for every one of your word cards. Then you will have a place to keep each word card so you can find it whenever you want it for games or reading or writing.



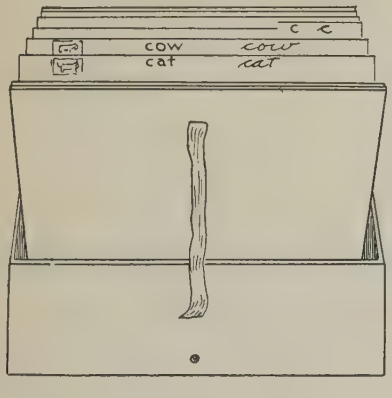
Suppose you begin making file cards for the color words. You will find the color words on page 42 of your Work Book. The colors are at the back of your

Work Book. Mount them as in the picture at the bottom of page 2052.

The words at the top of page 42 are "light blue," "light green," "pink" and "lavender." Sometimes you read and write about them. On your file card for blue you may add the little piece of light blue from the back of your Work Book and by it the printed words "light blue" and the written words "light blue." Do the same for light green. Do the same for pink, because pink is light red. Do the same for lavender because lavender is light purple.

You will find the pictures and words for the file cards for your other word cards in the Work Book on pages 43 to 46.

When you are ready to file these cards on your wire, the first thing you put on is one of the light wooden boards you made. Then look at your first blue card. It has a. Have you any file card that belongs with it? Yes, apple. File the apple card, then the blue a card. Then look at the next blue card. What words have you that begin like that? Banana, big, brown and bear. File them on the wire and then the blue card. Then in front of the next blue card will come cat, cow, cent and so forth. You can match them up and find where each one belongs. I do believe you can do it yourself. But before you fasten the wire through them you better let mother look them over so they will surely be right when you get them all fastened in. Every file card must be in its own place.



NOW you are ready to put your word cards into your dictionary. In front of the file card for apple, put the word card for apple you use in your games. Then, whenever you take it out for games you will know just where to put it back in its own place. When you want it to trace so you can write it in a story you will know where to find it. In front of each file card put its word card.

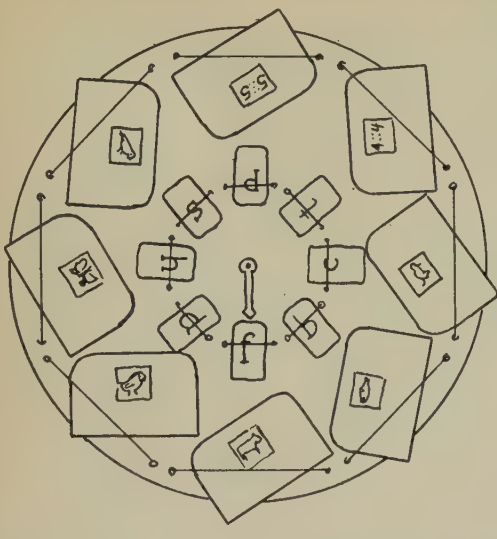
Note to parents: This making of file cards serves as a review in which the child can work pretty independently because of his familiarity with words and the general plan and arrangement of the Work Book. It leaves him with his dictionary in a convenient form for him to use for word study, for use in writing, and in a form in which he can gradually add the new words as he meets them in his experience.

WHEN you read and write stories you need to know words about people. On page 47 of the Work Book are the words for boy, girl, baby, man and woman. You know how to make the file cards for these now. Maybe you are writing about your toys, or about good things to eat and need word cards for them. You will find the pictures and the words for many new word cards on pages 54 to 76 of your Work Book, and words and pictures for their file cards on pages 47 to 53.

You might be puzzled with words like wings or tail. Which of these pictures says wings? Which says tail? Yes, the part that shows plainly in the picture tells what the word says. I think you can make up all the word cards and file cards now. When you come to the numbers and their names on pages 46 and 47 of your Work Book, you can put the right number of stickers with each number, by looking at your digit games. Look on pages 54 and 55 for the words and digits for your word cards for these numbers. On pages 56 and 76 are the words and pictures for many other words you may want to use when you are writing your stories. Make cards for them.

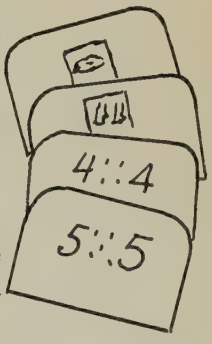
IF you want still other words in your dictionary, see if you can find the pictures in old magazines mother is willing for you to cut. And perhaps mother will help you find the printed words which you can cut out too. Or, if you have a printing set of your own, you and mother can print the words. And mother will write them for you so you can have them to trace when you wish to write about them in your stories. I am sure that you and mother can make up some fine games with these new cards.

THESE children are playing a game with their big wheel in which they have out many of the word cards from their dictionary.



You see they are picture side up. Then in the centre they have put some little cards with letters on. Maybe they have taken b t c f p s and h. Then they take all the cards from the dictionary that belong in front of those letter cards, and they scatter them all around in the wheel.

The first child has spun the spinner and it has stopped at f. So he is picking out all the pictured words that belong with the f. He has found feet, fish, five, four and he may find others. When he is through with his turn he will turn all these cards over. They all do begin with that letter f so he will score as many as he has found.



Watch whenever your playmate plays. Be sure he is right in each card he takes up. If you can show him when he makes a mistake before he finds it out from the back of the card, you earn an extra score for yourself. Add one more to your score every time you correct another child's play. It makes you watch very carefully, but that is the best way to learn about the way words sound.

When you know which words begin with the sounds these letters say, you can try others until you have tried all the letters in your dictionary. You may find some of them will play you a joke. Perhaps you will not have a single word card in front of some of the letter cards. Of course you will be making new file cards and word cards as you need them to write your stories, so your dictionary will be growing all the time.

THE NEXT HELPS TO LEARNING ARE ON PAGE 2267.

ORANGE GROVE AND MOUNTAIN PEAK

Photo, Putnam & Valentine.

California has become one of the chief fruit-growing regions of the world, and produces many varieties of delicious fruits. This picture was made from one of the hills near Los Angeles, which is one of the centres of the fruit industry. The orange bough makes a striking frame for the picture of an attractive countryside, but the crop is valuable as well as attractive.

A flourishing grapevine.

THE MOST IMPORTANT FRUITS

CONTINUED FROM 1857

NORTH AMERICA is fortunate above all other continents, so far as fruit is concerned. The earliest settlers found many delicious fruits already here and brought others with them from Europe. Somewhere in Canada or the United States nearly every kind will thrive, and as a result more kinds of fruit are plentiful and cheap than anywhere else in the world. Nowhere in Europe do we find fruit in abundance except on the shores of the Mediterranean, and there we miss some favorites.

English people are very proud of their fruit, and when we taste the apples, pears, cherries and plums which have grown on the sunny side of some wall, we appreciate how delicious they are; but the trouble is that comparatively few such fruits can be raised in Great Britain—not nearly enough to supply the demand, even at a high price. Some small fruits, however, are numerous and delicious—strawberries, for instance, and gooseberries. We do not know what gooseberries are until we have tasted the English ones.

Considering the world as a whole, perhaps the most prized fruits of all are the members of that great family of semitropical fruits known as the citrous fruits, which includes the orange, lemon, lime, citron, grapefruit, and others less familiar to us. Of these the orange, the lemon and the grapefruit are the most important.

The sweet orange is believed to be a native of southern China, from which country it has now spread to all the semitropical lands in every continent. Probably it was introduced into Europe by the Moors, for the Greeks and Romans do not seem to have cultivated the orange. The bitter orange, called the Seville orange, is similar to the sweet orange, except for the flavor. Both appear to be merely varieties of the same species of plant, and though bitter orange seeds are said never to produce sweet oranges, sweet orange seeds sometimes produce bitter oranges. This would suggest that the bitter orange was the original stock.

WHERE WE GET DIFFERENT KINDS OF ORANGES

Most of the oranges we eat are grown in Florida and southern California. Oranges from Florida are usually very juicy. The large seedless navel oranges are mostly grown in California. Whole trainloads from these states are sent out at one time and distributed all over the continent. We also get quantities of oranges from Cuba, Porto Rico, Jamaica and other West Indian Islands. Small oranges, later in the season, come from the Mediterranean

—especially from Spain and Italy; and it is from this region that Europe gets most of its supply.

The popularity of the orange has been due partly to the fact that it has been available for winter use when other fruits are scarce. The tree grows to a height of twenty feet, and where climate and soil are suitable one tree, occupying a space about twelve feet in diameter, will yield from three to four thousand oranges a year. It lives and bears for about a hundred years, and the older trees produce better fruits than the young ones.

THE STORY OF THE SPACIOUS ORANGE GROVES IN CALIFORNIA

The story of the seedless orange is interesting. In 1870 the Department of Agriculture in Washington received from a resident of Bahia, in Brazil, three cuttings of a seedless orange grown in that country for more than a century, but not a very good fruit, and useless for shipping. The cuttings were mislaid for a time, but when found were sent to a grower at Riverside, California. They were grafted on to a growing orange tree, and two of the cuttings lived. The fruit they produced was very good, and from those two cuttings have come many thousands of trees all producing large seedless oranges of a splendid flavor now grown all over California. All kinds of oranges are now grown in this state, and the harvest of one kind or another goes on all the year round.

There are many varieties of orange. Tangerines and mandarins are small and of delicate flavor, with skins that are loose when ripe, and sections that are easily parted. Kumquats are tiny olive-shaped oranges an inch long and are grown in Japan and Florida. They are eaten skin and all, although the skin is thick in proportion to the amount of pulp. The blood orange is a sweet orange, grown in Malta and elsewhere, which has its pulp mottled with crimson.

COUSINS OF THE ORANGE HAVE FOLLOWED IT ROUND THE WORLD

After the orange, the most important citrous fruit is the lemon, which originated in China or India, and has followed the orange tree into all five continents. Though lemons are extensively grown in California and the West Indies, the greater part of our supply is brought from Sicily and southern Italy. Palestine also furnishes some oranges and lemons. Like oranges, lemons are picked green and handled with great care, or, as lemon-growers say, they "must be handled as carefully as eggs." After being picked they are placed in dry, airy stores and there they slowly ripen. They keep much better than oranges, and fruit picked in December is quite good in July if air has been allowed to circulate freely about it.

Like the orange, the lemon seems to have been quite unknown to the Greeks and Romans. It was introduced into Spain from the East about the twelfth or thirteenth century. Unlike oranges, lemons are never allowed to ripen on the tree, for if they hang after attaining a certain size they deteriorate.

TWO MORE MEMBERS OF THIS IMPORTANT FAMILY

The citron, which grows wild in northern India, is cultivated in Europe, America and China for its thick rind, which is candied as a preserve. The fruit itself is not eatable when fresh. In the United States the name is sometimes incorrectly given to a near relative of the watermelon.

Another delicious fruit with which Florida and California keep us supplied is the grapefruit, which is grown in large quantities in both states. It also grows in the West Indies and in Mexico, but its original home is in the islands of the Pacific. It is known also as the pomelo, and two varieties—one of which has crimson flesh—are called the shaddock. These are more often grown in Jamaica. They are said to have been introduced into the West Indies by a Captain Shaddock. The grapefruit belongs to the same family as the orange and is cultivated in the same way. Its large yellow balls often grow in grape-like clusters, and it is from this fact that it gets its name. This fruit reaches its greatest perfection in Florida.

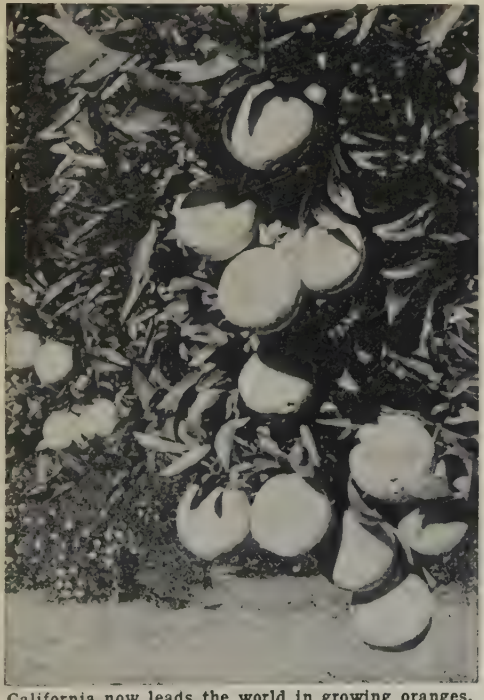
A DWARF PLANT'S BIG PLACE IN THE STORY OF THE SEA

The lime used in the making of lime juice is like a small greenish lemon with very sour juice. It grows on a dwarf plant often set in hedges. In the days of sailing ships, when voyages were very long and vessels were unable to carry supplies of fresh meat and vegetables, lime juice was one of the most valuable of all of a ship's stores, for it enabled the mariners who had to live on dried and salted foods to resist the ravages of

GATHERING ORANGES AND LEMONS

Boys gathering oranges in the groves at Jaffa, where fine oranges are produced.

Many lemons come from Sicily, and here the fruit is being gathered. © Underwood and Underwood.



California now leads the world in growing oranges, and her fruit is of the best.

In warm countries the melon grows in the open, but in England it will ripen only in hothouses.

scurvy, which often carried off half a ship's crew.

All the citrous fruit trees are evergreen, with shiny leaves and waxy white flowers. The skins of the fruits contain in their outer rind a large number of tiny reservoirs filled with a valuable and fragrant oil which is very refreshing and is used for a variety of purposes. The skins of many of these fruits, like the orange, lemon and citron, are candied and used in confectionery for flavoring cakes and puddings.

THE HUNDREDS OF USES TO WHICH MEN PUT THE BANANA

Among other fruits used in large quantities the banana, of which we read on page 1624, takes a great place. This is a very wonderful plant, and its uses are legion. It is very prolific, an amazement to all who know and study it. Four thousand pounds of bananas will grow within the same space of ground that is required to raise ninety-nine pounds of potatoes or thirty-three pounds of wheat, and while the potato and the wheat require constant attention, the banana asks for no human care beyond the removal of the old stalks as they wither.

The fruit is nourishing, whether eaten fresh or dried in the sun. When ground up, the dried fruit makes an excellent flour, and a beverage is also made from the banana. The leaves are used for thatching houses, and the fibre of the stalks is woven into a canvas used for clothing and sacking and rope. These are only a few of the hundreds of uses to which the banana plant is put. No wonder it has been called the "maid of all work in the vegetable world."

HOW THE BANANA GROWS, FRUITS AND DIES

The banana needs a warm temperature with a good supply of moisture, and the plant will then grow to a height of thirty feet, with leaves ten feet long; but in plantations it is not allowed to reach such a height, owing to the difficulty of harvesting the bunches. All the cultivation it needs is to reap the fruit and cut down and clear away the stalk so that a new shoot may have room to grow up from the rootstock which lives on. The stalk dies immediately after fruiting.

One of the fruits California cannot grow is the banana, and not very long ago this tropical fruit was a luxury hardly known outside of Eastern and Southern seaports; but now it is common and cheap all over the country. Bananas come to us by the shipload from Cuba and the other West Indies; but mainly from Central America, especially southern Mexico (Yucatan), Guatemala, Nicaragua and Costa Rica. Not only do the people of those countries produce them in large quantities, but many farmers from the United States and Canada have settled in those places and planted great fields of bananas of various kinds, as well as orange and lemon groves, coffee groves, and plantations of pineapples, for sale to us. Jamaica has very extensive plantations, but most of its product goes to England and other countries of Europe. Bananas are gathered while still green and gradually ripen on the stalk.

THE FINE TROPICAL FRUIT THAT FEEDS MILLIONS OF PEOPLE

The banana plant, though looking so much like a tree, is really only an herb, and the stems that look so substantial are formed merely of the sheathing bases of the leaf-stalks and are quite destitute of woody matter. When full grown, the stem is surmounted by a crown of leaves and has a palm-like appearance. A single huge bud springs from the centre of the crown of leaves and then turns down and blossoms. This develops into the bunch of bananas which may weigh from fifty to a hundred pounds or more.

The plantain, a large variety of banana, has less flavor and is cooked in the tropics as a vegetable. Some kinds of plantain in East Africa grow to the size of a man's arm. Millions of people in the tropics practically live on the banana, which is one of the most wonderful of natural foods. There are two members of the banana family that yield no edible fruit, but from the leaves of one of these we obtain the valuable fibre known as Manila hemp.

THE GRAPE HAS BEEN LONGEST CULTIVATED

The oldest of all cultivated fruits is probably the grape, a plant related to the well-known Virginia creeper which covers so many of our walls, and the foliage of which turns to such beautiful shades of red in autumn. In the world's oldest writings we read of men tending the vine and gathering the fruit of it, and for at least six thousand years grapes have been grown for food and drink. The seeds of the grape have been found among the lake-dwellings of the Bronze

THE LUSCIOUS FRUITS OF THE EARTH

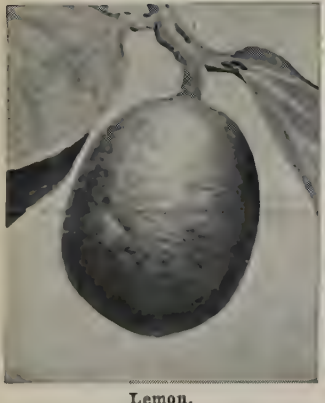
Apricots.

Loganberries.

Plums.

Red Currants.

Grapes.



Lemon.

Cherries.

Orange.

Fruits are improved by selection and cultivation. By choosing the best and breeding only from them, fine specimens are obtained. The loganberry is a cross between the blackberry and the raspberry.

Age. The vine grows wild in Western Asia, Southern Europe, North Africa and North America, but man has constantly improved the grape, until now there are over a thousand varieties, some of them exceedingly large and luscious. Some of our varieties have been developed from native grapes, some have come from Europe, and others are the result of crossing.

We have no need to import table grapes. Yet there is one sort, the large, greenish white, fleshy grape, called the Malaga, from a town in Spain, which we bring in great quantities in the autumn from the Mediterranean countries. Even this importation has lessened, however, because large vineyards of these are being grown in California. California also grows an immense amount of raisin grapes, which are made into excellent raisins, so that we no longer need to depend on Southern Europe for raisins. Greece and the Levantine countries still send us, however, all the "Zante currants" we use, which are not really currants but small dried grapes. Europe gets its raisins from Spain, Greece, Turkey and Australia.

The grape will not ripen out of doors in England, but there are many fine vines grown in hothouses. The great Hampton Court vine planted in 1768 fills a house 60 feet long and 30 feet wide, and in some seasons has as many as 1,700 bunches of fine black grapes. The vine at Cumberland Lodge in Windsor Park is nearly twice as big and produces 2,000 bunches. A single bunch of grapes weighing over twenty-six pounds has been shown in London. Belgium also grows grapes under glass.

THE INSECT THAT COST A NATION MORE THAN A GREAT WAR

The vine has many foes. Its greatest enemy is an insect pest known as the phylloxera, a native of the country east of the Rocky Mountains. This had always lived in the wild vines of America, but it attracted no particular attention until it was imported into France about 1860. It spread rapidly through the chief vine districts of Southern Europe, causing immense losses, and for a time the vineyards were swept away and the wine industry was ruined. All the damage was caused by insignificant creatures less than a sixteenth of an inch long. In France alone the phylloxera in a few years cost more than the Franco-Prussian War.

Both watermelons and muskmelons belong to the Gourd Family. They grow wild in the hottest parts of Africa, but are now cultivated in almost all the warmer regions of the earth. They are annual plants with trailing or climbing stems, and are related to the pumpkin, squash and cucumber. Watermelons often grow to an enormous size, and the record is held by a melon grown in Georgia which weighed 134 pounds. Of course there are many varieties of melon.

THE STRANGE COLLECTION OF FLOWERS THAT GIVES US THE PINEAPPLE

The pineapple is a table fruit quite different botanically from all the fruits that have been mentioned above. It is not a seed-case, but a collection of many flowers consolidated into one succulent mass. Grown in hothouses, a single pineapple has been known to weigh fourteen pounds. The pineapple plant grows on the ground. A number of long, sharp-pointed, rigid leaves with saw-like edges spring from the root, and in the middle of these a short flower-stem is thrown up bearing a single spike of flowers which becomes the pineapple. At the summit of the fruit there is a little tuft of small leaves, and this is capable of becoming a new plant. It is by means of these crowns and by suckers that the plant is propagated, and not by seeds.

The natives who gather pineapples for the market generally cover their legs up to the knees with thick cloth. Then they put on gloves made of thick canvas, and with short hooked knives cut the pineapples and put them in sacks slung from their shoulders. Grasping the tuft of leaves at the top, the harvester cuts off the stem at its base. The best pineapples come from Hawaii, but they are grown in many places, including parts of the United States, Mexico, the West Indies, the Philippines and South Africa.

THE APPLE, THE STRAWBERRY AND THE ROSE ARE RELATED

Many of the fruits we grow are members of the Rose Family. This is the case with the cherry, plum, damson, greengage, apple, pear, medlar, strawberry, raspberry and blackberry—they are all cousins and near relatives of the roses and of such familiar plants as the hawthorn, meadowsweet, agrimony and cinquefoil. It is a little difficult to see the connection unless we have studied botany.

HOW MAN HAS IMPROVED THE WILD FRUITS

Muskmelon.

Strawberries.

Pears.

White Currants.

Gooseberries.

Raspberries.

Apples.

Medlars.

These beautiful fruits have all been produced by man from the small fruits that grow wild in different parts of the world. In every respect they far surpass their wild ancestors.

The exceptions are the currants and the gooseberry, which are members of the Saxifrage Family. All the beautiful and delicious varieties of these fruits now used for dessert have been produced by means of careful selection and cultivation from the smallest wild varieties, generally hard and unattractive, that grow freely in the countryside to-day. Nowhere has man triumphed more than in the production of choice fruits from small wild plants. Our strawberries and raspberries now grow almost everywhere.

Fruits which grow better away from their old homes

Long before man cultivated these fruits he ate the wild varieties, and we find the remains of apples and pears among the lake-dwellings of Switzerland and Italy. Some of the fruits referred to have been carried to America and Australia and other temperate climates, where they sometimes flourish more than in their native homes. This is particularly the case with the apple, which grows nowhere better than in Nova Scotia in the North and in Tasmania in the South.

All over North America apples are so numerous and cheap that often thousands of bushels are allowed to fall to the ground and rot because the owner of the orchard cannot sell them for enough to pay for picking them. In the meanwhile perhaps city markets not far away have been fully supplied with apples that have come from farther away in another direction. Lately the city markets all over the country have offered very large shiny red apples that come all the way from the Pacific coast, where large associations of growers not only raise this big beautiful fruit successfully, but have powerful arrangements for sending the crop all over the country.

The beautiful fruit that came to Europe before Christ was born

The peach, regarded by many as the choicest of all stone fruits, was originally a native of China, where it has been cultivated from a remote period. It was carried into Europe at least three centuries before Jesus was born, and the early colonists brought it to America, where it thrives amazingly well.

Peaches are almost as common and cheap as apples in this country. The largest supply for the East comes from Georgia in the South, and from Michigan and Ontario in the North; but they are grown almost everywhere, and most of the fine canned peaches that we buy in the stores come from California. Apricots and nectarines come mainly from the Southwest and the Pacific coast.

Olives have been grown in California since the Franciscan Fathers first planted them in the garden of the San Diego Mission. There are many olive groves now in that state, and it sends us stuffed and pickled olives in attractive-looking glass bottles, ripe black olives, and some of our best olive oil.

In this country we know nothing of fresh dates. Dried they come to us from Egypt and other parts of Africa. On page 2157 we tell you of them, and also the story of the fig.

Few of us, as we eat some plump, juicy prunes for breakfast, or a delicious prune whip for dessert, are aware that the state of California alone produces more prunes than any other country. They are also grown in British Columbia and in Washington, Oregon and Idaho. As we know, prunes are dried plums, but all plums will not make prunes. Three varieties, commonly called the petite, the Italian and the silver prunes, have been found best for this purpose, and hundreds of acres of these plums are grown. The fruit is allowed to become very ripe, and is then picked, dipped for a minute into boiling lye to soften the skin, carefully washed, and dried in the sun, or in an evaporator.

Other wild fruits which have been improved

Among our native small fruits we have several varieties of blueberries and huckleberries. Some of them grown in low swampy ground, some on dry hard soil, and others, again, on the rocky ground of the mountainside. These delicious fruits grow wild in such large quantities and in so many places that very little effort has been made to cultivate them, and most of the berries that we find on the market have been picked in the woods and sent to the cities from long distances. Of late years in New Brunswick and in New Jersey the "wild" blueberry fields have been carefully looked after. Canneries have been built close to these fields, large quantities of the fruit are preserved on the spot, and a flourishing industry is growing up in what might otherwise be waste places.

The Department of Agriculture has made experiments and has found that

GRAPE-GROWING IN EUROPE

Although grapes will grow and partly ripen in the open in England, to come to maturity and yield really fine fruit the vines must be cultivated under glass. Here is an English vinery in full bearing.

In France, Italy and other warm countries of Europe the finest grapes can be grown in the open, where they are usually trained as bushes. Here we see the vintage being gathered in Tyrol.

Photographs on these pages are by courtesy of the Australian and Canadian Governments, and others.

GROWING AND DRYING FRUIT IN AUSTRALIA

Australia now grows some of the finest fruits, like plums, strawberries and raspberries, and here we see a young orchard that has begun to yield good crops. It is so arranged that water can be easily applied.

Raisins, as you know, are grapes of certain varieties which have been dried. Large quantities of raisins are now produced in Australia and sent to European markets. Here the grapes are being dried in the sun.

PINEAPPLE AND BANANA PLANTATIONS

Pineapples flourish in warm countries. Here is a plantation in Queensland, Australia. As the leaves are very sharp, the men who gather the fruit have their legs well protected.

While the bananas are still green the whole stem is cut down and the bunch gathered ready for the distant market. The fruit, however, is at its best when gathered ripe and eaten immediately.

improved varieties can be made to grow on ground which is fit for little else. Most of the blueberries are large and juicy, with a lovely blue bloom, and no more delicious fruit can be found. The huckleberry fruit is of a jet-black color, and one variety has gritty little three-cornered seeds which make it less agreeable for eating. Blueberries and huckleberries both belong to the Heath Family.

and the marshes of that region are largely given over to its growth. It grows best on low peaty ground. The plants are flooded during the winter season, but the bogs are drained in April. The fruit is picked in September and October and packed in barrels, and will keep for a long time. Large quantities are now exported, especially to France and the British Isles.

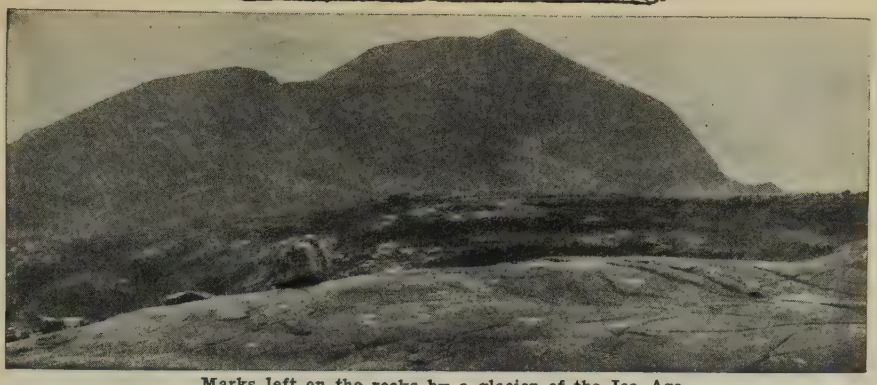
The peach is an Oriental fruit, but it grows even better in America than in its native home. It is difficult to say whether a peach orchard is more beautiful in the spring when it displays its pink blossoms or in the late summer when trees are loaded with the delicately colored fruit. There are many varieties of peaches which differ in size, color, flavor and time of ripening.

THE CRANBERRY, FRUIT OF THE MARSHLANDS OF THE NORTH

A close relative of these fruits is the cranberry, the rich red berry dear to our hearts at Thanksgiving and Christmas time. For this berry we are indebted to several provinces of Canada, the New England states, New Jersey, Michigan and Wisconsin. The cranberry that we know in this country grows only in North America, and it is only in North America that the cranberry is cultivated, so that we may truly call it a national fruit. Its cultivation was first begun on Cape Cod,

We have now named most of the important fruits, but we could write much more about them. A whole volume of our book could easily be given to the fruits. We have spoken principally of the taste, but this is not the only reason why we should eat fruit every day in the year. Fresh fruits contain substances which our bodies must have if we are to be healthy. These are found nowhere else in such a pleasant form as in ripe fruit. The easiest prescription to remember is: "An apple a day keeps the doctor away."

THE NEXT STORY OF PLANT LIFE IS ON PAGE 2155.



Marks left on the rocks by a glacier of the Ice Age.

THE STONY BOOK OF NATURE

CONTINUED FROM 1928

GEOLOGY is a science with many sides. We may be said to be studying geology when we use the spectroscope described on page 3922 to discover what a nebula is made of, or the microscope to find out what coal is composed of, or the test-tube and blow-pipe to examine the chemistry of a metal, or the X-ray to determine the structure of a crystal.

It is a science, indeed, wider than the earth which gives it its name, for it is bounded on the one side by the nebulæ and on the other side by the atoms. It deals not only with the earth as made, but with the earth in its making—with earthquakes, avalanches, volcanoes, glaciers and the like.

And, as we have seen, we cannot get very far without a consideration of life and of the buried remains of living things. Among departments of geology may be named: cosmical geology, the study of the earth as a heavenly body; metallurgy, the study of the metals in the earth's crust; dynamical geology, the study of the changes in the earth; structural geology, the study of the structure of the earth; palæontological geology, the study of the fossils in the crust of the earth; physiographical geology, the study of the existing outlines of sea and land. Most of these studies require special scientific instruments.

Such a great science, covering such a vast field, must, of course, be largely in the hands of experts who know the most about it. Nevertheless, there are great parts of it which "he who runs may read." Some of its most wonderful discoveries have been made by men with neither a wide knowledge of the earth itself nor of science generally. A whole chapter of the earth's history may be read in a piece of chalk or a bit of flint.

Dr. William Smith, called the "father of English geology," who prepared unaided the first geological map of England, had no education save what he received at the village school, and was by profession a land-surveyor and engineer. But he took an interest in the world beneath his feet, and in the course of his professional journeys he gained unusual knowledge of the rocks of England and Wales. A railway cutting or a canal was enough to reveal to him the strange secrets of the earth's crust.

Hugh Miller, the son of a sailor, also had little education. He spent his early years as a mason, and his later years as a bank accountant. He became a great authority on the Old Red Sandstone, and published some remarkable books on geology—Old Red Sandstone, The Footprints of the Creator, and The Testimony of the Rocks. Here he speaks of fossil beds.

Who, after once spending even a few hours in such a school, could avoid being a geologist? I had formerly found much pleasure among rocks and in caves, but it was the wonders of the Eathie Lias that first gave direction and aim to my curiosity. From being a mere child seeking amusement in looking over the pictures of the stony volume of Nature, I henceforth became a sober student, desirous of reading and knowing it as a book.

THE STORY WRITTEN BY NATURE IN THE ROCKS

"The stony volume of Nature" in which the Scottish mason read such wonderful stories is open to all of us. Not all of us can be specialists and experts in special branches of geology; but every one of us who walks a road, or climbs a hill, or watches the waves breaking, can get joy and instruction out of many pages of the "stony volume." We read of the Cretaceous Age and of the white rocks formed out of the shells of little sea creatures. We have only to see great white cliffs of veritable chalk, or to sail past the Isle of Wight to behold the Needles standing up like monuments to tell us of long-past ages, to show us, too, how the sea is devouring once again the rocks that were formed hundreds of years ago on its floor. All along the south coast of England we have these lovely tattered white pages of the earth's history—the White Cliffs of Dover, Beachy Head, the Needles.

On the coast of Maine, again, we see the granite rocks, once forced out molten, now tortured by the elements into fantastic shapes. In many parts of the coast of New England we find the same gray crystalline rocks forming bare ledges, crags, turrets and precipices. Along the Hudson we find lava-flow resting on shale and sandstone.

THE TERRIFIC UPHEAVAL WHICH MADE THE GIANT'S CAUSEWAY

It requires no expert knowledge to recognize these things, to recognize the white chalk laid at the bottom of the sea, the hard rocks once melted by great heat, the lava resting on the shale; and surely the recognition makes the world a more interesting place to dwell in.

If we sail across to the Giant's Causeway, in Ireland, we can study the wonderful remains of a terrific overflow of basalt lava which has cracked up like dried mud into columns. The great bed of these, which is called the Giant's Causeway, consists of an unequal checkered pavement composed of the tops of these columns. Walking on these, we can think of the red rift in the earth's crust when the immense flood of lava poured out like a sea.

That is a great monument to one of the great geological upheavals. North America is full of such records.

In many sections where sedimentary rocks are laid bare we can see how the rocks have been twisted, folded and compressed by the contractions of the earth. Here we find slight bendings, here we have puckerings mountain-high. We can trace, for instance, the great irregular twistings of the millstone grit, or the folding and cleaving of the ancient slates, or the huge curves of the Silurian rocks. And we may notice that in places limestone has been turned into marble, and that strata of rocks have been not only crumpled, but twisted and displaced. We require no expert knowledge to see these things: they are as plain as folds and tears of a garment. We can discern, too, without much difficulty, that great folds and puckerings have been worn down by natural agencies.

THE STORY THAT THE GLACIERS HAVE LEFT BEHIND FOR US ALL TO READ

There are signs that we can easily find of alterations in the level of the land. We can perceive that the bays on the coast of Maine and Oregon were once mountain valleys; and we can find inland raised beaches that were once at sea-level.

Moraines, long piles of rocks and earth deposited by retreating glaciers, are visible in many places. Anyone in the northern part of the United States who keeps his eyes open, can find "erratic boulders"—single rocks carried by glaciers and finally deposited far from their first homes. If we look more carefully, we can often see stones scratched by the great glaciers which invaded part of our country during the earliest part of the Pleistocene Age. We may even observe on ancient rocks ripple marks, the unmistakable impression of raindrops, and the footprints of animals.

The whole of the world, indeed, as we have said, is a colossal book of geology.

Some of the pages may be yet unopened, and some may be read only by specialists, and some need microscopes to decipher, yet many of the most interesting pages require only to be seen with intelligent eyes to be understood.

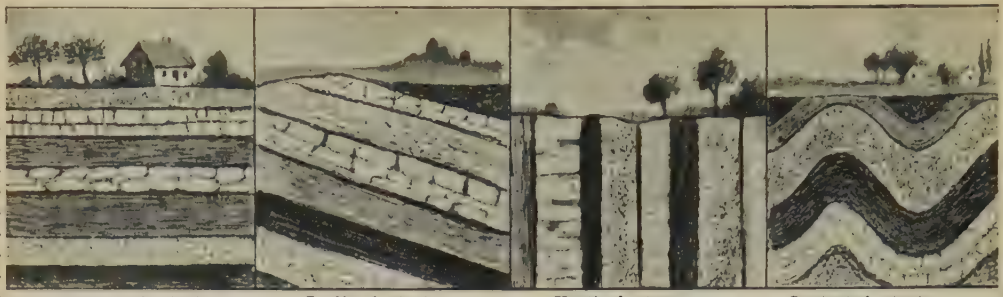
THE NEXT STORY OF THE EARTH IS ON PAGE 2169.

A PICTURE MUSEUM OF GEOLOGY

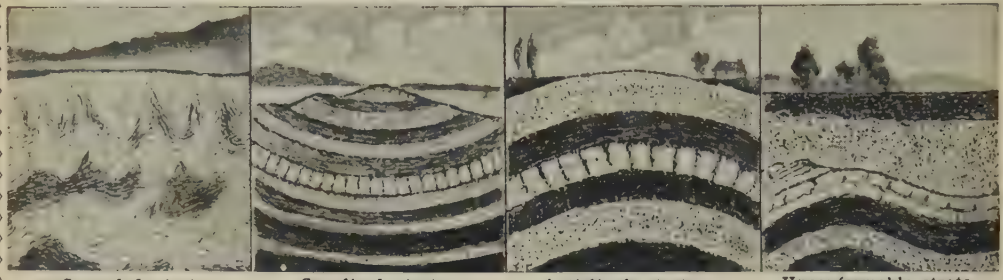
An interesting example of the clearing and folding of slate.

Stalactites in Calgoolup Cave, West Australia, forming what is called The Pulpit.

A LITTLE DICTIONARY OF GEOLOGICAL

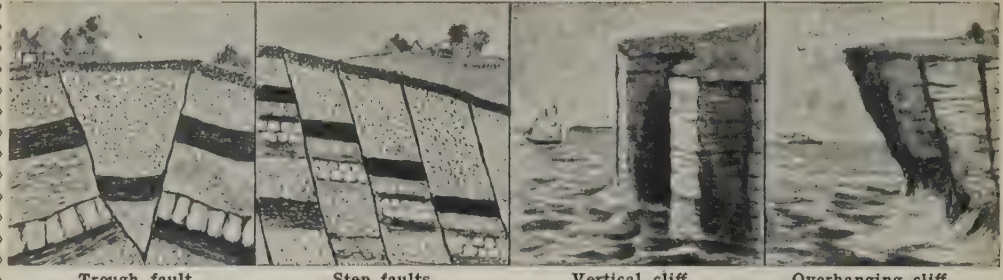


Horizontal strata. Inclined strata. Vertical strata. Contorted strata.

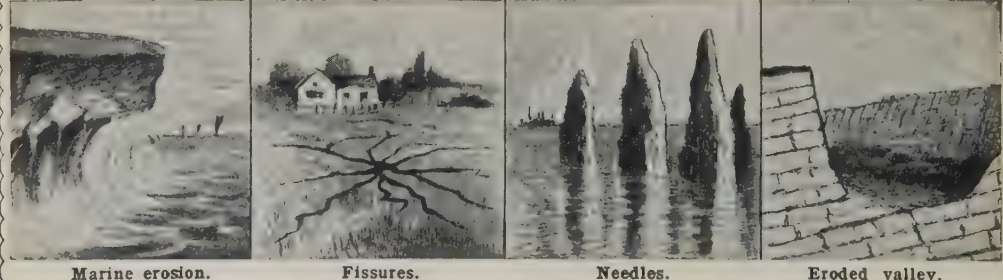


Crumpled strata. Synclinal strata. Anticlinal strata. Unconformable strata.

Overlap of strata. False bedding. Joints. Fault.

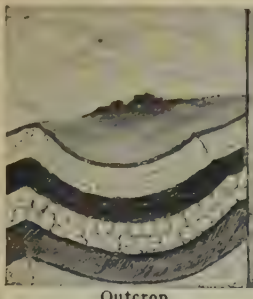


Trough fault. Step faults. Vertical cliff. Overhanging cliff.



Marine erosion. Fissures. Needles. Eroded valley.

FORMATIONS EXPLAINED IN PICTURES

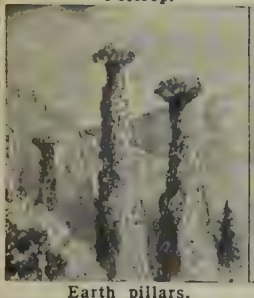


Outcrop.

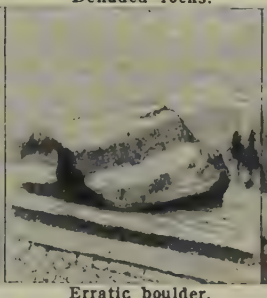
Denuded rocks.

Outlier.

Escarpment.



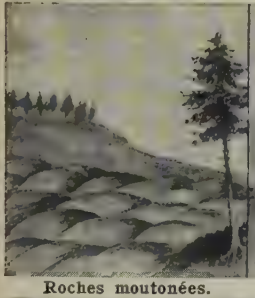
Earth pillars.



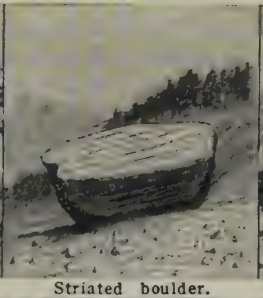
Erratic boulder.

Glacier table.

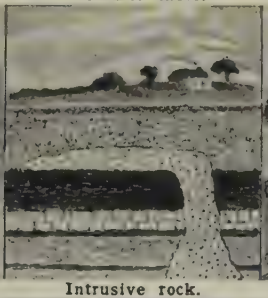
Perched rock.



Roches moutonées.

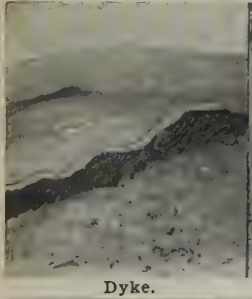


Striated boulder.



Intrusive rock.

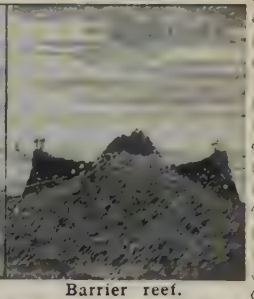
Veins.



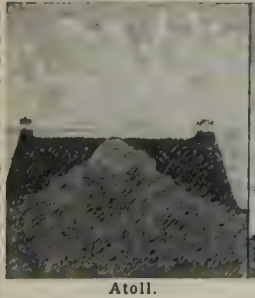
Dyke.

Columnar basalt.

Fringing reef.



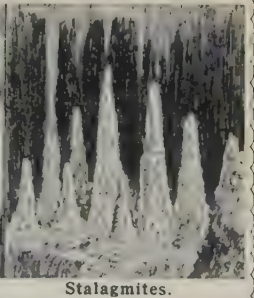
Barrier reef.



Atoll.

Nodules.

Stalactites.



Stalagmites.

HOW THE EARTH PILLARS CAME THERE

Here we see a remarkable group of earth pillars in Tyrol, each with its umbrella rock on top. The different heights indicate that the pillars are at various stages in formation, the tallest being the oldest.

This picture shows how the earth pillars seen above were formed. The rain sweeping down on the landscape washed away the soft bed of rock, but where large stones were imbedded these acted as umbrellas.

HOW A POT-HOLE IS MADE

A fine example at Ballycastle, in Ireland, of a marine pot-hole—a round cavity in the rocky shore carved out by the grinding action of stones and pebbles whirled round and round by the sea.

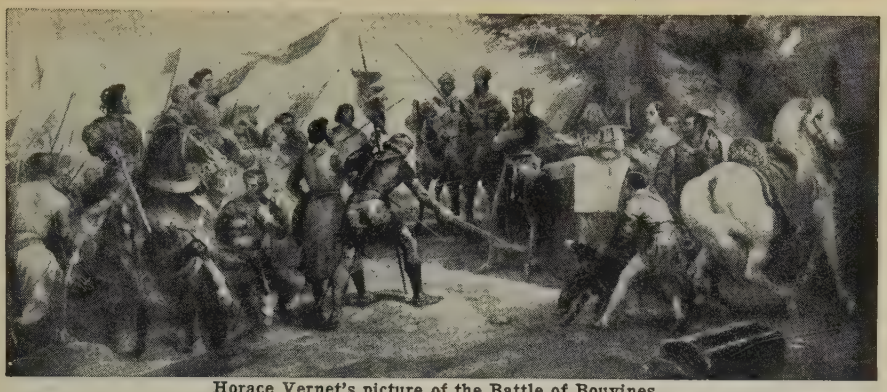
In this photograph, taken at Glenariff in County Antrim, we see a pot-hole actually in course of formation. The water rushing in from a flooded stream is whirling the stones round and round.

A PORTRAIT BY J. L. DAVID

Photo, courtesy Metropolitan Museum of Art.

MLLE. CHARLOTTE DU VAL D'OGNES, IN THE METROPOLITAN MUSEUM, NEW YORK

2070



Horace Vernet's picture of the Battle of Bouvines.

FRENCH ART AFTER THE REVOLUTION

CONTINUED FROM 2005

TOWARD the end of the eighteenth century the eyes of Europe were turned toward France, where Revolution seemed to mean an actual turning about for everything. Government, literature, art, religion—all life appeared to be taking a new direction.

A strong wave of interest in everything classic swept along, lifting men and women upon a crest of enthusiasm for imitating the Greeks and Romans. Even their clothes had to be modeled after the ancient styles. There are several things that help to explain this revival of attention to the life and art of the past.

About the middle of the century the buried cities of Pompeii and Herculaneum had begun to come to light under the spades of excavators; and at the same time two men had by their books and drawings been spreading a knowledge of the beauty in Greek and Roman art and architecture, even when in ruins. One was a German archæologist—Winckelmann—who studied and wrote about the treasures of classical antiquity. The other was Piranesi, an Italian architectural artist and engraver, whose hundreds of fine engravings of buildings, monuments and decorations carried a knowledge of their dignity and splendor into many lands. The Colosseum, Trajan's Column, the Arch of Titus, Hadrian's Mausoleum, the Pantheon and many other glories of an older day in Europe were brought before the eyes of modern men near and far by means of this engraver's tools.

The natural tendency in France is to follow an appeal to the mind and to appreciate anything that has fineness of construction. It is easy to understand, then, that the door opened quickly and swung wide to admit the classic idea. Indeed, it was not a new idea in French art. You remember that Poussin's pictures are the very embodiment of classic feeling and are examples of a truly classic style. Even Greuze was masquerading rather than really living as a romantic painter. His genre looks academic and studied when placed beside the Dutch and Flemish genre. Of the French painters only Chardin could be as "natural as a Dutchman." He was an exception, standing alone.

Before the Revolution began, the undercurrent of sympathy with the classic spirit had been coming nearer the surface of life and thought. The softness and sentimentalism of the work of Boucher and others—unworthy followers of Watteau—grew wearisome. A return to sterner expression was welcome.

Boucher himself had a pupil named David, who was to become the strongest force in bringing about the triumph

of the classic revival in French art. But Boucher, recognizing that this pupil's genius was of a sort that could never be at home with his own style, had the good sense to refer him to another instructor, J. M. Vien, a pioneer in the return to classicism. Correctness in drawing, perfection in form, and balance in composition were the aims of this school. With Vien young David went to Rome to study the treasures of the old galleries.

Jacques Louis David (1748–1825) was one of those leaders of men who are sure to make a place in a nation's story. He was an extremist; he drove a wedge through other people's opinions. He had no patience with criticism, and loathed compromise. Most of the art world of France in his time was like wax in his hands. He was a strong politician, and brought about the break-up of the Academy founded by Mazarin and Colbert. But it seemed as if there must be some kind of national institution. During Napoleon's consulate the academy appeared again, but with changed name and lesser powers.

David played the part in French art of a second Charles le Brun. But Le Brun had served a king; David gave his services to the Republic after the fall of Louis XVI. He illustrated the tale of the glory of Napoleon. Where the artists of Louis XIV had tried to make classic and Italian art French, David aimed to put classic art in the place of French art.

He did not feel the value of native style. Such skill as the French had learned he would throw away; all those characteristics which stamp the genius of a people with their own individuality he would wipe out. There must be for him nothing but timeless, flawless Greek beauty, something set apart, unique in the world's history. It was as true, he thought, in the days of Bonaparte as in the days of Praxiteles.

DAVID'S FAMOUS PORTRAIT OF MADAME RÉCAMIER, IN THE LOUVRE

This, of course, was an impossible position. One cannot set back the clock for two thousand years and pretend that nothing of any merit has happened since.

A curious, cold shadow of David's ideal clings to his work in portraits such as those of Madame Récamier and M. and Mme. Sériziat, in the Louvre. He could be magnificent at times, as in The Coronation (of Josephine), which is one of the finest compositions of the French school. His French soldiers, his Bonaparte, were made of the stuff of Greek and Roman warriors. He stamped the pictures of the Napoleon era with something of the spiritual grandeur of his ideal. Later on came men who painted pictures

PICTURES BY VERNET, DAVID AND INGRES

The Taking of the Smala, by Horace Vernet.

Portrait of M. Bertin, by Jean Ingres.

An Eastern Trader, by Horace Vernet.

The Coronation of Josephine by Napoleon, painted by David, at Versailles.

of Bonaparte's armies from the point of view of the obscure soldier, the pathos of weary men stumbling blindly on, suffering from cold and from lack of food. But David was thrilling with a fine and abstract heroism. The compositions he most loved were those of Greek and Roman story, such as The Oath of the Horatii, and Leonidas at the Pass.

This remarkable man so controlled the period that other artists are classed as followers of David or those who refused to follow his leadership. His influence reached beyond the realm of painting. For instance, we read that at his suggestion a famous actor playing the part of Brutus adopted the toga and sandals of the Romans for that rôle, instead of appearing, as had been the custom, in the clothes of his own day, even to the red-heeled shoes and curled wig.

DAVID'S PUPIL WHO BECAME ONE OF THE WORLD'S GREATEST DRAFTSMEN

In David's pupil Ingres, the same passion for Greek art burned bright. Ingres (1780–1867) was one of the greatest draftsmen the world has known, but he distrusted and disliked color. If a picture were perfectly drawn, he thought, no painting was necessary. He saw the world as a huge "line" drawing. As he expressed it, "in nature all is form."

While his work was without warmth or fervor and he had no power to invent, Ingres could draw with a mastery that was pure genius. He would spend hours, days, drawing draperies, hands, heads, the long sweeping line from a woman's neck to her finger-tips. It would seem, in looking at reproductions of his pencil work, that no one before or since has come within hail of his perfection. His pencil portrait group of the Stamati family, in the Bonnat Collection, Bayonne; his drawing of Madame Delorme, in the Louvre, show to what heights this neglected and beautiful art of fine point drawing may attain. To him, more than to anyone else, France owes the finished draftsmanship for which French art is noted.

Ingres was naturally a maker of portraits. In those that he painted his color was not very happy; one has to forgive this for the sake of the draftsmanship that shines through the pigment. The best of these portraits are: M. Bertin, in the Louvre; Madame de Senonnes, in the Nantes Museum; and Madame Devauçay, in the Condé Museum, Chantilly.

Ingres made himself a little ridiculous by his too-great enthusiasm for the ancient Greeks. To him there was only one poet in the world—Homer. Shakespeare and Goethe he set aside as of no importance because their style of writing was not Homer's. His finest epic painting—a decoration on a ceiling in the Louvre—is called the Apotheosis of Homer. It shows writers and artists grouped about the ancient poet in awe and adoration. In color it is dull and uninteresting.

PRUDHON MINGLES WARMTH AND LIGHT WITH CLASSIC STRENGTH

One of David's most famous contemporaries was Prudhon (1758–1823), who is to be remembered for many attractive qualities. The art of portraiture, which had been since the reign of Louis XIV one of the increasing glories of the French school, was strengthened by Prudhon. He had a great love for classical subjects, but to this he added a warmth and wealth of color which the Greeks did not know. He had a worshipful feeling for Leonardo da Vinci—the man who had learned the secret of the play of light and shade on flesh tints. In Prudhon's portraits and other pictures we can perceive both his own genius and these great influences. His works are counted as treasures of France: among the finest are the portraits of the Empress Josephine and Madame Copia, in the Louvre.

Prudhon could paint better than he could draw, perhaps because he was so absorbed in the beauty of light effects and other problems of the colorist. There are several pictures in the Louvre which show how much he had learned of these subtle problems. He was still of the classic group, but his art was forward-looking, leaning toward what was to come.

CLASSICAL ART PASSES AND A NEW VIGOR IS BORN IN PAINTING

The classic wave, rising, had swept the taste of the people away from the sentimentalism of the gallant age. Now its place was to be taken by a new wave which came rolling in—a wave of romanticism.

Young artists of the days when David was an old man found classic art too lifeless and rigid, and began to turn away from it. But though we may agree with them that the art of an age-long past could not be revived to become a living, moving part of modern time, we must

remember that classicism had served a purpose. It had stifled much weak, unnecessary work.

In David's time a young artist called Gros (1771–1835), one of the strong men of the period, unconsciously prepared the way for the new school. Although he was severely taken to task by David, and told to "turn over the pages of Plutarch" if he wanted inspiration, he persisted in choosing subjects of a more human and less distant kind than those which inspired David and his followers. He was capable of handling large canvases without losing the interest and fire of his original purpose.

There is something very living in a picture like his Embarkation of the Duchesse d'Angoulême, which is in the Bordeaux Museum. His people really seem alive; whereas in many of David's paintings you feel that if you undressed the figures they would be cold statuary underneath their garments. But Gros's fame is the result of the fine work he put into his pictures of Napoleon and the army—Bonaparte at Arcola, Bonaparte at Jaffa and Bonaparte at Eylau.

A PAINTER WHO MARCHED WITH NAPOLEON, THEN MADE BATTLE PICTURES

Gros had been a soldier himself, and he added to his genius as a military painter his personal knowledge of life on the field. His picture of Napoleon at Eylau is the first really good military picture of France. David and his followers painted pictures of Napoleon's army, but they were the pictures a man who had never been in a battle or on a march, would paint, and they all "smelled" of a studio. Those of Gros were intensely real. And apart from the place which he had won as a military painter, Gros had moved his art into a more human field some distance from David's camp.

Géricault, who lived from 1791 to 1824, was another painter who in his short life did some excellent work and went farther on in the new direction. There is a study of "flying" horsemen in the Bayonne Museum that is a miracle of energy and strength. In the Louvre is his best-known picture, The Raft of the Medusa, a terrible shipwreck scene—a harrowing theme presented in a dramatic and romantic composition.

A young friend of Géricault carried on the spirit of his work and that of Gros. This was Delacroix, who lived from 1799 to 1863 and was destined to be the leading spirit in the new romantic school.

THE YOUNG FRENCHMEN WHO MADE PICTURES TELL STORIES

This body of artists got their name, romanticists, from the kind of pictures they chose to paint, in opposition to the theories of classicism. They took subjects from Dante, Shakespeare, Byron, or from European history. Their work expressed freely the individuality of the painter, and in this way was a striking contrast to the work of David, who thought that all pictures should look as if they had been painted by Greek artists.

Instead of trying to paint an ideal, cold and impersonal, these younger men gave room to their own personal feelings. What the artist thought, and especially what he felt, was the thing he would put into his picture for the rest of the world to read. Because of their individuality of expression we can hardly call these painters a school.

With them began a style of painting on a large scale, with breadth and a sense of history—the picture which tells a story. There was a danger, of course, that the story would become more important than the art. We can understand why Ingres, fearing that art would lose its stern grandeur, hated the new school. But before his death the new kind of painting had come to the front in France. Delacroix set the fashion, then, and youth asked nothing but to follow it.

There were some lively scenes in Paris in the days of the young romanticists. They were fighting not only the classicists of their own generation, but those of earlier centuries whose traditions had stiffened into a scheme of laws to govern painting.

"There is no recipe," said Delacroix, "by which one can attain to what is ideally beautiful. Style depends absolutely and solely upon the free and original expression of each man's peculiar qualities."

He himself painted with a restless energy, without hesitation or timidity, putting his thought and feeling into color—perhaps actually thinking and feeling in color. He used the scale of color as a musician uses the scale of sound. If Ingres could do without color, Delacroix could almost do without drawing. He seems to have composed his pictures in color without first planning the details.

THE BOLD AND VITAL ART OF DELACROIX AND THE ROMANTIC SCHOOL

His subjects were those of violence and peril. Medea and her children, Virgil and Dante in Hell (Dante's Boat), the Taking of Constantinople, and the Massacre of Scio, in the Louvre, and the Battle of Taillebourg, in the Versailles Museum—five vivid compositions painted boldly with rich color—stand for the measure of his genius to-day. Before he died he had plowed a deep furrow in the stony soil of French art.

The gifted men who grouped themselves about Delacroix, and those who followed after, imitated his choice of subjects. They painted battle scenes, historical incidents, pictures of the East—a whole gallery of courageous and sincere work. There was Decamps (1803–60), one of the finest colorists of France, who went to the Orient and painted pictures of Eastern life. He was less impetuous than Delacroix, but in his restraint there is an added richness. His Bell-ringers, in the Louvre, and Children Coming out of a Turkish School, in the Museum of Decorative Arts, Paris, are fine little pictures. Fromentin, the artist who, being able to write as well as paint, produced the finest art history of nineteenth-century France, worked under the influence of Delacroix. Then there were Flandrin, Delaroche, Meissonier, Regnault, Léopold Robert, Horace Vernet and many more. An interesting company they were, each good in his own way.

Meissonier must be singled out in this brotherhood as a favorite painter of war pictures, of which "1814," in the Louvre, stands at the head. He was not only a war painter but a history painter. The elegance of the Napoleonic period, the costume and arms of fighting men, are shown in his work with great exactness and perfection of detail. The finish of his work is almost microscopic in its fineness. There is more of the skill of the craftsman than the feeling of the man in his pictures.

He and other painters of the glory of Napoleon's career form a separate group of historical artists who have made vivid that picturesque period of French history. Another of Meissonier's Napoleon pictures is given on page 2212.

Photo, courtesy Metropolitan Museum of Art.

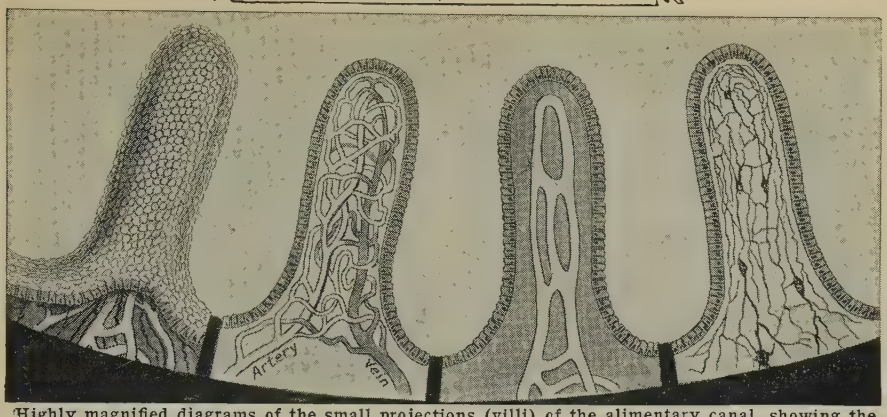
MEISSONIER'S SPIRITED PICTURE OF NAPOLEON, CALLED FRIEDLAND, 1807

The romanticists had not all the fire of Delacroix, but their pictures have the same effect on the eye that a ballad well recited has on the ear. They awaken images in the mind and illumine events.

Delaroche was a fine teller of tales from English as well as French story. His Princes in the Tower, in the Louvre, is an excellent example. Horace Vernet and Léopold Robert were also chroniclers in color of scraps of a nation's history. Vernet's Taking of the Smala, in the Versailles Museum, has all the joy of a good illustration for a thrilling tale.

For the impulse to romanticism in painting had come through the influence of writers of tales and of romantic poetry; and the movement had been interwoven with the intense experience of France during the revolution that had meant the rebirth of the nation.

THE NEXT STORY OF THE FINE ARTS IS ON PAGE 2109.



Highly magnified diagrams of the small projections (villi) of the alimentary canal, showing the cells covering them and the capillaries, arteries, veins, lacteals and nerve-cells.

HOW TO EAT

CONTINUED FROM 1933

WE have seen that food, properly chewed and mingled with saliva, is swallowed and reaches the stomach. This is the largest and most important of the hollow organs of the body; but when we call it "hollow" we must not fancy that it is something like a football, with a great space inside it. There are no such unfilled spaces in the body. When the stomach is empty, as it should be for some time before every meal, its walls are pressed against each other. When food enters it, they make room; and the greater the supply of food, the more the stomach enlarges in proportion. A healthy stomach always accurately fits its contents.

The stomach is a muscular bag which lies in the abdomen, rather to the left side and under the left part of the liver, which is the largest gland in the body. This bag has two openings in it: one on its upper side, which is the opening of the gullet and admits the food; and one on its right, where the stomach becomes narrow and almost pointed, and leads into the bowel. The walls of this bag are beautifully made: first of a very smooth coat on the outside, which enables it to move freely against its neighbors; then of a middle coat, which is made of muscular fibres; and finally of an inner lining, a mucous membrane.

The middle, or muscular, coat is made of three layers of fibres running in various directions, and it has most important duties. It *churns* the contents of the stomach. When we have eaten anything, these various fibres start moving in a regular way, for a long time—even for three or four hours—sending the food from end to end of the stomach, backward and forward, and turning it over so that every part of it can be properly digested. Also, as the walls fit the food closely, whether we have taken much or little, they help to crush and soften it. But the stomach possesses no teeth, and its walls are thin and are far less powerful than the thick muscular walls of the heart. A bird has no teeth, but its body has special powers to make up for that. If we do not use our teeth, the stomach cannot do their work for them; but its muscular wall does its best. When we are well, we are no more aware of these movements than we are of the ceaseless beating of the heart.

The inner coat, or lining, of the stomach is still more wonderful. It is a mucous membrane; that is to say, it has tiny glands in it which produce

mucus. But that is not all. It also has at least two other sorts of glands in it—little pits, or tubes, in the lining of the stomach, lined with living cells which have a most remarkable power. One sort of these glands produces the substance known as hydrochloric acid. Now, common salt is a necessary part of the food of all living creatures. In us and in a large number of animals it is the source of the hydrochloric acid produced by the acid glands of the stomach. The salt, or sodium chlorid, is brought to the cells of the glands by the blood, and they split it up into its two parts, acid and alkali. The acid they pour into the stomach, where it serves a most important purpose in digesting food. If a chemist desires to split up sodium chlorid outside the body, he can do so, but only with a great deal of trouble and by the use of very powerful substances which are not found in the body at all.

A THING THAT NO MAN UNDERSTANDS AND WE CAN ONLY MARVEL AT

No one understands at all how it is that this very strong compound can be split up by the cells of the glands in the stomach, without difficulty or the use of any powerful acids. We can only put it down to the power of the life of the gland-cells, and marvel at it.

Sometimes when people are ill their stomachs cannot produce the hydrochloric acid they need to digest their food, and then the doctor gives them hydrochloric acid as a medicine. Every time we take salt at our meals we should remember what use the gland-cells of the stomach will make of it—not at once, but when it has entered the blood and has been carried by the arteries to nourish and supply the stomach-wall.

The second kind of gland in the stomach—and neither kind is found anywhere else in the body—is no less wonderful. If we look at their cells under the microscope, as they are *before* a meal, we find a number of specks of something lying in them. These specks have been made by the cells—from the blood, of course. But if we look at these cells *after* a meal, we find that all the specks have disappeared.

THE LITTLE SPECKS OF PEPSIN AND THE WORK THEY DO AFTER A MEAL

The reason for this is that, about half an hour after a meal enters the stomach, these specks of stuff are melted and poured into the stomach, where they are mixed with the food as it is churned. The specks consist of a *ferment* called pepsin, without which the stomach cannot digest the food. Often, in cases of illness, when the stomach is not making pepsin properly, we take the stomach of a calf, get the pepsin out of it—it is got as a yellowish powder—and give it as a medicine to the ill person.

If either hydrochloric acid or pepsin be given to a healthy person, his stomach ceases to produce them for itself. This is another instance of a great law of all life, that the health of any part of the body can be maintained only if it does its own work. If its work is done for it, it becomes lazy and helpless. Pepsin can easily be got at a drug store, and many unwise people dose themselves with it, not realizing that they are thereby preventing their stomachs from doing their own work. When you start taking pepsin regularly, you must go on doing so, for your stomach is made lazy and incapable. The only right time to give pepsin—except for a very short period—is when we know that the stomach has become quite unable to make it for itself.

HOW OUR FOOD IS PREPARED FOR ITS ENTRY INTO THE BLOOD

Now we must see what the hydrochloric acid and the digestive ferment pepsin do to the food. The hydrochloric acid first acts on certain parts of the food and makes them ready for the pepsin. The pepsin then ferments, or digests, them, until they are changed into new substances fit to be taken into the blood. Thereupon the stomach opens its door into the bowel, which is guarded by a strong ring of muscle and has been tightly shut all this time. The stomach contents pass through into the bowel, a small quantity at a time, until the stomach, which has been shrinking again all the time, becomes empty.

Thus we can learn the uses of the stomach. It is a place where the saliva can digest, or begin the digestion of, the starch of the food. It is a bag which holds a quantity of food and takes care of it, so that we can eat a meal and go about our business until we need another. It is a guardian of the health and right working of the bowel, for it admits nothing but soft, almost liquid, stuff to the bowel, and that only in suitable quantities at a time. And it is a living bag

which, by its living power, produces ferments to begin the digestion of food.

And yet, wonderful as it is in its working, we usually rather overrate the importance of the stomach, notwithstanding all its powers. It is quite possible to live happily and healthily without a stomach at all. Sometimes it is necessary to remove the stomach entirely. Then the food passes straight into the bowel from the gullet. Of course, in that case people must take small meals, and certainly must use their teeth well.

In that case the food is digested in the bowel. We shall have to learn that the digestion which goes on in the stomach can be dispensed with, and is never the most important part of digestion. All the digestion the stomach and the saliva do can be done entirely within the bowel. This is not to say that the saliva and the juices of the stomach are not important and valuable. It is true, however, that, in this all-important matter of preparing the food for its entry into the blood, the body has more than one or two or three "strings to its bow," as people say.

The three classes of our food that require digestion are: the proteins, or albumins; the starches and sugars (called carbohydrates); and the fats. The first group is partially digested in and by the stomach; the second group is partially digested in the stomach, but not by it; the third group is not digested in the stomach at all. Thus, the fat in milk, which we call cream, undergoes no change in the stomach, but floats to the top of the food there as it does in milk. There is only one part of the body that can digest everything properly, and that is the bowel.

The tube which disposes of the useless part of food

The bowel is a long coiled tube, which begins where the stomach ends, and ends in a straight part called the rectum, where the useless part of the food, and also a substance called bile, which the liver sends to the bowel, is collected and disposed of every day by healthy people.

The bowel is twenty-five or thirty feet long, and this extraordinary length teaches us that it must have some very important work to do, which requires time and thoroughness. Every meal we eat spends from twenty-four to thirty-six hours in the bowel, being digested all the time, and sorted out and prepared for use and for the disposal of what cannot be used.

The bowel, like the stomach, has three coats, and they are of the same kind. The middle coat, however, is made of muscular fibres that mostly run right round the bowel in circles—not of fibres running in all directions. The reason for the difference is that the contents of this long tube do not require to be churned backward and forward, for the stomach has already softened them and made them almost liquid. They require merely to move slowly onward, and the circular fibres of the muscular coat of the bowel contract, one after another, in a slow movement, like a sort of wave.

The wonderful glands and the work they do

But it is the inner coat, or lining, of the bowel—the mucous membrane—that is specially wonderful and interesting. Besides glands that produce mucus it has a large number of special glands which produce ferments for digesting the food. Already we know quite a number of special ferments which different parts of the bowel produce, and there are doubtless many more; but even the bowel does not produce the most important and powerful of the digestive ferments, any more than the stomach does. They are produced by a special gland called the pancreas, which we find in all animals with backbones, and which sends its juice through a tube that opens into the bowel about four inches below its beginning—so that the food from the stomach is very soon exposed to the action of this remarkable juice.

The juice of the pancreas, or sweetbread, contains at least four ferments, three of which are the most powerful ferments we know. One of them digests albumins, or proteins; one digests starch; and another digests fat. This is the first time the food has met anything that can deal with the fat or oil in it, which is one of its most valuable parts. Neither the saliva nor the juice of the stomach is of any use in dealing with fats.

The cells of the pancreas and the way in which they help us

The cells of the pancreas have specks of stuff in them which they have made and which they melt and pour through the tube of the pancreas into the bowel when food enters it. The food, when it leaves the stomach, is acid, and this acid,

when it enters the bowel, is the signal to the pancreas that its juice is wanted. If for any reason the juice of the pancreas is not forthcoming, we find that we cannot digest and use the fats in our food. Our digestion suffers, but the digestion of fats suffers most, for there is nothing to take the place of the juice of the pancreas in this highly important respect.

The liver sends its own product into the bowel, as the pancreas does, and just at the same place. This product has the special name of bile; and when anything is wrong with its production we say that the person is bilious. The bile is brownish yellow in color, and its color is due to the remains of the red matter, or hæmoglobin, of old red blood-cells that have been broken down in the liver. The bile is a help to digestion in many ways, though it does not contain any ferments. It seems to prepare the fat of the food for the juice of the pancreas to act on, and it does this by breaking up the fat into a number of very tiny drops which can easily be acted upon and digested. We say that it turns the fat into an "emulsion." Also, the bile is very poisonous to microbes. So, indeed, is the hydrochloric acid produced by the stomach.

How the strength of our food enters into our blood

When the food has been digested and turned into new chemical substances which are fit to enter the blood, the part of the food which is of no use—such as the hard stuff in the stalk of the cabbage—is passed along the bowel until we get rid of it. But now the useful and digested part of the food has to enter the blood. This it does in a very special way. Throughout many feet of the bowel we find a new kind of thing occurring in its mucous membrane. These things are little projections—there are countless thousands of them—which stick out toward the inside of the bowel. They are covered with a layer of cells and are richly supplied with capillary blood-vessels. Their business is utterly different from that of any of the glands we have been reading about. They exist, not to digest the food, but to absorb it—to take it into the blood when it is digested.

The whole object of eating is to get into the blood the substances it requires. Everything else is meant to prepare the food for its absorption into the blood. The cells covering these tiny projections of the mucous membrane of the bowel are alive and are extraordinarily clever. They pick up from the contents of the bowel what is ready for the blood, and pass it through themselves and through the thin walls of the blood-vessels that are pushed in little loops into the projections, and then it is carried by the blood-stream to every part of the body. We can take a piece of the mucous membrane of the bowel of an animal, and if we keep it warm we can watch it *living* for a time.

The little vessels that carry the fat through the body

We can see, then, how the cells covering these countless little projections do their wonderful work, and we notice the very curious fact that, while they pass into the blood all the parts of the food that have been made ready for them, they do not pass the fat into the blood. Fat cannot pass into the capillaries (except by being *eaten* by the capillary walls). If it did, it would all go to the liver, whereas other cells need fat. The fat is passed into another set of vessels called *lacteals* (from the Latin word for milk, which is *lac*), and so it is carried upward through the body until the lacteals pour the fat into some of the large veins that lie near the neck. The lacteals have this name because, after a meal, they look as if they were filled with milk.

And now we must learn the great lesson that we live, not by what we eat, but by what we absorb. If a man were to eat the best food in the world in large quantities every day, but were not to absorb it into his blood, he would die of starvation. The food is of no use so long as it is in our mouths or in our stomachs or in our bowel; it is useful only when it is in our blood. If it does not enter the blood it is all wasted, and until it enters the blood it does nothing for us.

How we can eat without gaining strength

Foolish people who have something the matter with the wonderful machinery we have described, or who do not care whether they eat too much so long as the taste is pleasant, may be surprised that their food does not give them strength. They forget that we live only by what we digest and absorb.

THE NEXT STORY OF OUR OWN LIFE IS ON PAGE 2185.

WHAT THIS STORY TELLS US

EVERY nation has in the pages of its history some heroes, some great deeds or some incident in the national life which it desires to hold in remembrance, or some object to which it attaches some special significance. The United States is not behind in this. There are a number of the days on the calendar which are specially set apart as holidays, and this story tells us the reason why this has been done. Most of these days are kept in remembrance of the past, but one of them is kept so that the children of the present may be able to prepare a blessing for the children of the future.

THE DAYS WE CELEBRATE

CONTINUED FROM 1924

WHAT is a legal holiday? Almost every boy and girl will answer, "It is a day when all the schools and shops are closed and we don't have to work, and can have a good time." Yes, assuredly, a holiday is a day for having a "good time." But how many of you who hail Washington's Birthday and the Fourth of July and Thanksgiving Day so joyously ever stop to think of the real significance of the events which these holidays commemorate? Such holidays are the memorial stones raised along the path by which a nation rose to greatness. Every country has its special days set apart from the routine work of the year in memory of some great man or great event in the nation's history or for the performance of some public duty to the State.

Strictly speaking, we have no national holidays in the United States. In fact, the general government has no power to declare a holiday, except in the District of Columbia and in the territories, though it can order the Post Office and other public offices closed. However, certain days are observed in every state by the act of the legislatures.

The days observed by every state are New Year's Day, Washington's Birthday, Memorial, or Decoration, Day, Independence Day, Thanksgiving Day and Christmas. Every state except Wyoming celebrates Labor Day. Other holidays are celebrated by one or more states, but not by all.

It was the unswerving determination and courage of one man—Christopher Columbus, an Italian by birth—that first brought the great continent, on which our nation was to rise, to the attention of Christian Europe.

The difficulties that Columbus faced on that first voyage can never be truly known. In a strange sea, with rough weather and a mutinous, terror-struck crew, it was only the indomitable purpose of the man that kept them on their westward course. Daily the sailors implored him to turn his ships toward home. They swore that they were in a haunted sea and a thousand unknown terrors dogged their footsteps.

"I will not turn back till, with the help of God, I find that land," Columbus said. In his poem Columbus, Joaquin Miller has given us a wonderful picture of the calm courage and dogged persistency of the great discoverer. Every child should learn this poem, which you will find on page 485.

At last one morning a cry went up from the ships. Land was in sight! It was the island of San Salvador in the broad Atlantic. Thinking that he was near India, Columbus called the islands the "West Indies."

Four hundred years later the president of the great nation which had risen on the land discovered by Christopher Columbus made the following

recommendation to the people of the United States:

> Now, therefore, I, Benjamin Harrison, president of the United States of America, in pursuance of the aforesaid anniversary of the discovery of America by Columbus, recommend the same as a general holiday for the people of the United States. On that day let the people, as far as possible, cease from toil and devote themselves to such exercises as may best express honor to the discoverer and their appreciation of the great achievements of the four completed centuries of American life.

This was the first celebration of Columbus Day. Now it is celebrated every year in about thirty-five of the states.

GEORGE WASHINGTON, PRESIDENT, BORN FEBRUARY 22, 1732

It is interesting to know that the first public celebration of the birthday of General George Washington took place during his own lifetime. General Washington was one of the few great men who did not have to wait until after death for recognition of his greatness. Commander-in-chief of the American army in the great struggle for independence and first president of the new nation, he was adored by his soldiers and revered by the people.

It was his friend Count de Rochambeau, who, as a graceful acknowledgment of the good-will between France and the new country, first celebrated the general's birthday. The French count had been in America barely six months and was stationed at Newport, Rhode Island, with his soldiers. His letter to General Washington acquainting him with the holiday is as follows:

> Yesterday (Sunday) was the anniversary of your Excellency's birthday. We have put off celebrating that holiday till to-day, by reason of the Lord's Day, and we will celebrate it with the sole regret that your Excellency be not a witness of the effusion and gladness of our hearts.

Washington received this letter while in his winter quarters in New York State, where he was anxiously watching the movements of the British army. He replied:

> The flattering distinction paid to my birthday is an honor for which I dare not express my gratitude. I confide in your Excellency's sensibility to interpret my feelings for this and for the obliging manner in which you are pleased to announce it.

After the Revolution the celebration of Washington's birthday very naturally took the place of the observance of the king's birthday. Since then Washington's birthday has been celebrated more or less generally throughout the United States, and to-day it is a public holiday in every state in the Union, and also in the territories.

ABRAHAM LINCOLN, PRESIDENT, BORN FEBRUARY 12, 1809

Abraham Lincoln was a child of the soil. Born in 1809, in Kentucky, in what was then almost a wilderness, he struggled upward with unswerving purpose against great odds. The contrast between the raw stripling of the western woods and the sad-eyed man at the helm of the nation through the storm of the Civil War is striking. When the country was divided against itself, the North against the South, brother's hand against brother, it was Abraham Lincoln who saved the Union.

You will find the thrilling story of Abraham Lincoln on page 1045. He was one of the greatest men the world has yet seen, and his story should be graven on the heart of every American boy and girl as a standard of high endeavor and great thinking without thought of self. His birthday is a holiday in nearly thirty states. Two of the greatest men in our history were born in February.

ROBERT E. LEE, BORN JANUARY 19, 1807; JEFFERSON DAVIS, BORN JUNE 3, 1808

The birthdays of the two great leaders of the Confederacy, General Robert E. Lee and President Jefferson Davis, are set apart as holidays in many parts of the South. Jefferson Davis and Robert E. Lee, although they thought they owed a duty to their country, believed that they owed a higher duty to the states in which they were born, so when their states seceded, these men followed their states.

Robert E. Lee, a distinguished engineer officer, had served in the Mexican War, and many thought him the ablest officer in the United States army at this time. When the Civil War seemed about to come, President Lincoln sent Frank P. Blair to offer him the command of the army of the United States. He was a graduate of West Point, and the offer of the command of the army in which he had spent his life was the greatest honor the president could offer him. But he did not hesitate an instant in taking

This picture, made from an old print, shows the artist's idea of the celebration of the first Day of Thanksgiving at Plymouth, Massachusetts, in 1621. Its quaintness makes it attractive, even if it is not entirely accurate. In the early times of which it tells us, the day was kept as a solemn festival. Everyone went to church, and special sermons were preached.

The celebration of Arbor Day originated in the western prairie states, where there are very few trees, and a day was set aside for the planting of trees and vines and shrubs. In other states the rapid destruction of the forests has led the teachers to use the occasion to tell children of the importance of trees and to teach them their importance to the well-being of the nation.

the course that he believed to be right. "I am opposed to secession, but I will take no part in an invasion of the Southern states," he said, and resigned his commission.

A few days later he took command of the military forces of Virginia, then entered the Confederate service and finally became the general-in-chief of the Confederate army. General Lee's grasp of the situation in the South was masterly, and despite the tremendous odds against him, he was able to win many victories, but finally surrendered with his army at Appomattox Court House.

General Robert E. Lee was not only a great commander, but a great man. He had the gift that drew men's hearts to him, and his soldiers gladly followed him. When the Southern army was surrounded at Appomattox and General Lee, unwilling to lead his brave fellows to certain death, surrendered, the men could not understand what had come to them. General Lee had surrendered! It could not be possible! But it was, and the men who had followed him through battle, hardship and starvation broke down and sobbed like children when they learned the truth.

General Lee bore defeat as greatly as he had borne his duties and advised the South to accept the result in good faith. He had risked all his possessions in the championship of the Southern cause, and at the close of the war he was offered the presidency of Washington College, at Lexington, Virginia, now Washington and Lee University. He held this position until his death, a little over five years after the close of the war. His birthday is observed in all the states which seceded except Louisiana and Texas.

Jefferson Davis, although perhaps not such a lovable man as General Lee, was a man of great ability and strength of character. He was popular throughout the South, and at the beginning of the Civil War was elected president of the Confederacy.

The strain of the awful years of war and the hardships of his imprisonment in Fortress Monroe after the war, broke down his health, and when he emerged from prison he was an old man. The Southern people have never forgotten the hardships that this man bore for their sakes, and to-day his birthday is observed as a holiday in ten of the Southern states.

THANKSGIVING DAY, THE LAST THURSDAY IN NOVEMBER

The Pilgrims had been in the New World for nearly a year. The springtime sowing had taken place and all the summer the fields had been watched with great anxiety, for all knew that their lives depended upon the coming harvest. The summer crops came to a richness of fruition beyond all expectation, and late one day in the fall Governor Bradford sent four men into the forests to shoot wild birds. "We will hold a harvest feast of Thanksgiving," he said, and invited the Indians who had been friendly to the strangers to rejoice with the white men. The Indians came bearing gifts of venison, and the harvest feast lasted three days.

This was the first Thanksgiving Day celebrated in America, and little by little, as new colonies settled the land, the custom of a yearly Thanksgiving spread throughout the country.

General Washington perfectly expressed the spirit of the day in his Thanksgiving Proclamation in 1789:

> Whereas it is the duty of all nations to acknowledge the providence of Almighty God, to obey his will, to be grateful for his benefits, and humbly to implore his protection, aid and favors. . . . Now, therefore, I do recommend and assign Thursday, the 26th day of November next, to be devoted by the people of these States to the service of that great and glorious Being, who is the Beneficent Author of all the good that was, that is, or that will be; that we may then all unite in rendering unto him our sincere and humble thanks for his kind care and protection of the people of this country, and for all the great and various favors which he has been pleased to confer upon us.

Until the Civil War the celebration of the day was merely a state affair. During the Civil War it was suspended for a time, but in 1864 President Lincoln issued a proclamation appointing the fourth Thursday in November thereafter as a national Thanksgiving Day. When Lincoln was assassinated it almost caused this rule to pass out of existence, but the succeeding presidents took it up, and since then Thanksgiving Day has been regularly observed throughout the United States. The proclamation by the president is sent to the governors of the different states, each of whom issues a corresponding proclamation for his own state.

IN MEMORY OF WAR DAYS

This picture of Fort McHenry, near Baltimore, calls to mind the origin of our famous song The Star-Spangled Banner. The author, Francis Scott Key, was confined on a British ship during the bombardment in September, 1814, and the flag mentioned in the poem was the one flying from the fort, which all the British power could not force the defenders to haul down.

May 30 is generally observed in the Northern states as Memorial Day, and patriotic services are held and the graves of the soldiers who died during the Civil War are decorated. Flowers bloom earlier in the Southern states and therefore "Decoration Day," as the corresponding holiday is often called there, occurs as early as April, in some states, but usually early in May. There is no uniform date for the holiday in all the Southern states.

PATRIOTIC DAYS—FLAG-RAISING DAY, JUNE 14, 1777

Flag-raising Day was first recognized on June 14, 1894, when, at the request of the Sons of the Revolution and the Colonial Dames of America, the Stars and Stripes were raised on all the public buildings to commemorate the first use of the national flag.

The first American flag is said to have been made by Mrs. Betsy Ross, an upholsterer and seamstress who lived in Philadelphia. The thirteen white stars in the blue field in the upper left-hand corner of the new flag represented the thirteen colonies, as did also the thirteen alternating stripes of red and white. Later, when Vermont and Kentucky entered the Union, the number of stars and stripes was increased to fifteen, but still later Congress voted to return to the original thirteen stripes, adding a new star on the Fourth of July following the admission of each new state.

Previous to the adoption of the national emblem each colony had its own flag. But when the new flag was approved by Congress it was at once copied by patriots all over the country. The day is not usually officially observed, but many individuals are careful to hang out the flag on that day.

It was the sight of this glorious flag floating on Fort McHenry that inspired Francis Scott Key, who had been detained on one of the British ships, to write The Star-Spangled Banner, which you will find in the Book of Poetry.

INDEPENDENCE DAY, THE FOURTH OF JULY, 1776

Independence Day is a holiday that is odserved in every state in the Union, and celebrates the adoption, on July 4, 1776, of the Declaration of Independence, which declared our separation from Great Britain. It was Richard Lee who proposed to Congress "that these United colonies are, and of right ought to be, free and independent states; that they are absolved from all allegiance to the British Crown; and that all political connection between them and the State of Great Britain is, and ought to be, dissolved." John Adams seconded the motion, and Thomas Jefferson drew up the Declaration of Independence which has made him famous forever.

At the time of the adoption of the Declaration, John Adams wrote his wife a letter which reads like a prophecy: "I am apt to believe," he said, "that it (the day) will be celebrated by succeeding generations as the great anniversary festival. It ought to be solemnized with pomp and parade, with shows, games, sports, guns, balls, bonfires and illuminations from one end of this continent to another, from this time forward for evermore."

With true patriotic fervor Americans have thrown themselves into the celebration of this glorious event, and wherever they may be, few of them forget to hold festival in honor of the birthday of the nation. There was a time, not very long ago, when children, and many grown-up people, too, thought the best way to mark the day was to make as much noise as possible with firecrackers, or even firearms. But these days are past, and the day is spent in ways that are more worthy of the nation.

A DAY OF SORROW AND PRIDE—MEMORIAL DAY, MAY 30

From 1861 to 1865 our country was convulsed by a terrible Civil War. Brave men left their homes and their families by thousands to join the army of the Blue or the Gray. Men burned with the zeal of patriotism, and whether they fought for the Union or for the South, they fought for the cause they thought was right. The women of the North and the South remained at home to sew and pray for the safety of their loved ones.

At last peace was established. The Union was saved, but at the cost of thousands of the lives of our country's bravest men. There was scarcely a village or a neighborhood in the North, and none in the South, that did not mourn its dead.

The women of the Confederacy began to go at various times in different places to strew flowers on the graves of their soldiers, and presently the beautiful custom spread to the North. General John A. Logan, commander-in-chief of the Grand Army of the Republic, set aside May 30 as Decoration Day for the graves of the Union soldiers who had died in the Civil War. Gradually the observance spread from state to state. The name was changed to Memorial Day, the better to voice the feelings of those who observed it. Each year the governor of each of the northern and western states proclaims the day as a legal holiday. As flowers appear earlier in the South, the

date of the observance is earlier there. Alabama, Georgia, Florida and Mississippi observe April 26, and North and South Carolina observe May 10.

ELECTION DAY, SET APART TO VOTE FOR OFFICEHOLDERS

We have been considering holidays which are memorial days, days set aside in memory of some great event or some great man. Now we come to those days which have been made holidays for the performance of some public duty.

Presidential Election Day comes once every four years, and Congress has appointed the first Tuesday after the first Monday in November for this purpose. Many of the states elect their governors and other state officials on this day. Where they elect officials in other than a presidential year they have generally adopted the same rule, that is, the Tuesday after the first Monday in November.

No day brings greater responsibilities than Election Day. In most states all men and women over twenty-one years of age, native-born or naturalized, may go to the polls to cast their votes for the officials who are to govern them and make their laws. In olden days the government was in the hands of a powerful few, and it is only within a few generations that the franchise has passed into the hands of the citizens.

Since the signing of the Declaration of Independence the United States has stood for liberty and equal rights, and each voter who enters the polling booth is claiming his privilege to take part in the government of his country. The right to vote is something that every American boy and every American girl should think about very seriously, for the future welfare of our country lies in right voting, in voting for honest measures and honest men to carry out those measures. In some countries failure to vote is an offense that may be punished by law. In our country the decision is left to each person. Therefore there is all the more reason why each one should accept his responsibility and appear without fail to cast his vote in favor of men who will uphold the ideals of government inherited from the men who fought for them in the War of Independence.

DANGEROUS FUN

ARBOR DAY, SET APART TO PLANT TREES FOR THE FUTURE

Arbor Day has been set aside by many states for the planting of trees and shrubs along the highways and in other places where they are needed. One purpose of this celebration is to implant in our boys

and girls, our future American citizens, a love of nature. Another purpose is to impress the necessity of planting trees for the future.

There is no uniform date set apart for Arbor Day, as it necessarily varies in different states, owing to the differences in climate. It was first set apart by the State Board of Agriculture of Nebraska in 1872. Prizes were offered for counties and persons planting the largest number of trees and vines throughout the state, with the result that over a million trees were planted in the first year, and over 350,000,000 trees and vines within the twelve succeeding years. In the West there are many treeless plains, and this beautiful and useful custom of planting trees at once aroused the interest of other states, and the plan was generally taken up throughout the country.

LABOR DAY, THE FIRST MONDAY IN SEPTEMBER

The first Monday in September is generally observed all over the United States as "Labor's Holiday." Then the great army of workers, rich and poor alike, all over the country, put aside their tasks.

Labor Day was made a holiday in the District of Columbia by Congress in 1894, and is a holiday in the same sense as Washington's Birthday or the Fourth of July. The Congressional act makes Labor Day a legal public holiday in the District of Columbia and requires the closing of all federal offices throughout the United States. Labor Day is a holiday in every state except in Wyoming. In the Philippines May 1 is observed.

ARMISTICE DAY, THE ELEVENTH OF NOVEMBER, 1918

When the war which grew into the World War broke out in Europe in 1914, few persons really believed that the United States would be drawn into the conflict. The various influences were too strong, however, and in April, 1917, the country became a participant. Two million men were sent to Europe, and as many more were in training on this side. On November 11, 1918, the German Empire wished for an armistice (which means a truce), and the cruel slaughter ceased. The day has been declared a public holiday in about half the states.

MOTHER'S DAY, THE SECOND SUNDAY IN MAY

This is not a legal holiday in any state, as it is fixed on Sunday, which is already a holiday. The idea is that this day shall be set apart in honor of the mothers of our land. Generally a red carnation is worn in remembrance of a mother who is living and a white carnation in memory of a mother who has died.

HOLIDAYS NOT OBSERVED IN SO MANY STATES

Few states observe religious holidays (we except Christmas), but Good Friday, that is the Friday before Easter, is observed in eight or ten states. Since Easter may occur in either March or April, the date may vary nearly five weeks. Shrove Tuesday and All Saints' Day are also observed in Louisiana.

Many states observe some important date in their history. For example, Massachusetts and Maine (formerly a part of Massachusetts) observe Patriots' Day, April 19, the date of the battles of Lexington and Concord. North Carolina observes May 20, the date of the Mecklenburg Declaration of Independence. Texas observes March 2, Sam Houston Day, and April 21, the anniversary of the battle of San Jacinto. Several states observe the anniversary of the day on which they were admitted to the Union.

WORLD HOLIDAYS—NEW YEAR'S DAY AND CHRISTMAS DAY

Both New Year's Day and Christmas are legal holidays in the United States. The old custom of making and receiving New Year's calls has almost died out, but wherever the winter climate will permit, New Year's eve is celebrated with horn-blowing, fireworks and jollity. In Pasadena, California, a lovely fête of roses is given on January 1, when beautiful processions pass through the gaily decorated streets, while automobiles, carriages, horses, bicycles and "floats," often having historical significance, are trimmed profusely with roses of every hue.

Long ago, in the Puritan colonies, all exhibitions of gaiety and happiness were considered sinful and Christmas was not observed. In fact, the stern old Pilgrim Fathers made a law forbidding anyone to celebrate Christmas on pain of arrest and punishment. Nowadays, however, Christmas is celebrated in New England just as it is everywhere else because a little Child was born in Bethlehem long ago.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 2281.

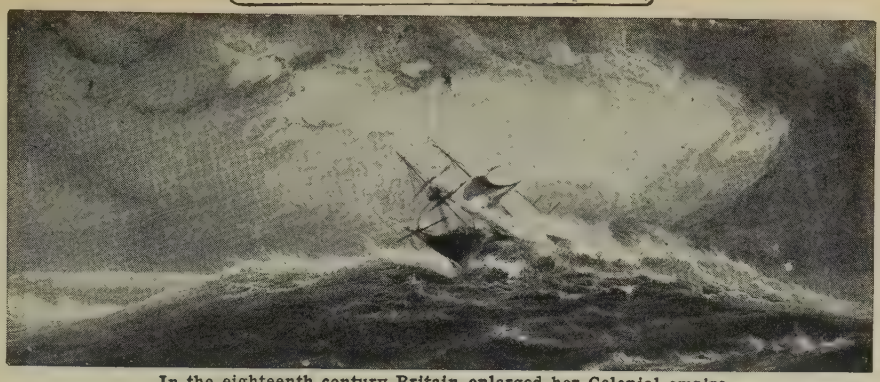
A SAFE AND SANE FOURTH

The old-fashioned Fourth of July, with its firecrackers and explosions of powder, became so dangerous that all over the country other forms of celebration were substituted for the noisier forms. This picture shows part of a parade of nationalities, one of the first held in New York City, where much is done to teach children born in other countries that they are Americans.

This picture, also made in the vicinity of New York City, shows an obstacle race, which was one event in the games held in celebration of the day. The authorities have forbidden the sale and discharge of firecrackers, and fireworks may be set off only by special permission given to responsible parties, but celebrations are held to impress the day on the minds of children.

At the beginning of the nineteenth century, in the long struggle between the nations of Europe during the time of Napoleon, England defeated the French and Spaniards in a great sea battle, at Trafalgar, represented in this picture. Although Lord Nelson died in this battle, it was a triumphant victory for the British nation, whose ships he commanded, for this battle gave Great Britain her power at sea.

The wonderful career of Napoleon, about which we read in many parts of our book, ended at the battle of Waterloo, near Brussels, represented in this picture. Here Napoleon, having escaped from the island of Elba, where he had been exiled on his defeat by the nations of Europe, gathered his forces for a final conflict. He was again defeated by the allied troops under the Duke of Wellington, and afterward surrendered.



In the eighteenth century Britain enlarged her Colonial empire.

FROM THE STUARTS TO NAPOLEON

CONTINUED FROM 1981

THE closing years of the Stuart period had been years of war which left France the most powerful country on the Continent, though she had suffered several defeats; while Great Britain, under the leadership of the Duke of Marlborough, had won back her fame as a military nation, and had established her position as the country most to be feared at sea.

Meantime Spain and Portugal were steadily declining from first place as pioneers in discovery, and France, England and Holland were seeking overseas the riches that had already weakened their southern rivals. The South Sea Bubble, an empty business speculation that spread ruin widely over England, was a wild scheme for securing supposed riches which Spain had missed in the South Seas.

The choice of a distant German cousin of Queen Anne, George of Hanover, a Protestant, to be king of England when Queen Anne died, had one good effect. It left the government in the hands of Englishmen, leaders of the two rival parties, the Tories and the Whigs, and it settled once and forever the question whether the king could rule absolutely or not.

Otherwise it was an absurd arrangement, for not one of the German kings who preceded Queen Victoria had the smallest qualification for being a British king. George I could not speak English, and cared little about the country that invited him to its throne. George II also was interested chiefly in his Hanoverian dominions and their protection. George III, an amiable man, simple, obstinate, and frequently out of his mind, made himself in his sane periods a party politician; and his successors, George IV and William IV, were men of quite as little mind and much less character. With such a succession of kings, at first foreign and afterward incompetent, the government of the country fell naturally into the hands of the chief parliamentary leaders, and Great Britain became, alone among the nations, a land where personal government by the king had ceased, and ministers, whose qualities commanded the confidence of the public, held the power.

The first of such ministers was Robert Walpole, who for many years controlled the government during the reigns of the first two Georges. He it was who, by his strong personal influence among other ministers of the crown, came to be known as the Premier. Before his time all the king's ministers had regarded themselves as equal. As George I could not speak English and knew little of English politics, he could not preside at Cabinet meetings, and so it came about that the English king ceased to attend

Cabinet meetings, and the First Lord of the Treasury became the Cabinet leader —a custom which has continued with few exceptions to the present time. The term Prime Minister, though long in general use, was not officially recognized until 1905.

England prospers in trade under Walpole's peace policy

The chief aim of Walpole was to keep the country out of war and to enable it to prosper in trade and commerce. This he did until its prosperity placed it far ahead of other European nations in wealth ready for use. Between the wars of Marlborough and the Seven Years' War in the middle of the eighteenth century the country had a period of rest and recovery, and all the while was steadily spreading its influence, by colonization in the West and by trade in the more distant East. Because of England's peace and prosperity the exiled Stuarts did not receive much help when they tried to come back. The son of James II, "the king over the water," James, called the Pretender, came over in 1715 but failed to regain the throne. Thirty years later his son, Charles Edward, "Bonnie Prince Charlie," was received with great enthusiasm by the Highlanders, but the English Jacobites (from the Latin *Jacobus,* James) did not rise to help his cause, so Prince Charlie suffered defeat in Scotland and was forced to flee overseas.

George I died in 1727 and was succeeded by his son George II, whose clever wife, Queen Caroline, liked Walpole and kept him in office until he was forced to declare war against Spain. A Spanish coast-guardsman had cut off an English captain's ear and the English people demanded satisfaction. They thought Walpole was not sufficiently in earnest about the war, and he had to resign two years after it started.

After Walpole, the next great national leader who arose to serve his country's needs was William Pitt, "the great Commoner," as he was called, though he became later in life a member of the House of Lords, with the title of Earl of Chatham.

Pitt was a man of far finer quality of spirit than Walpole. Walpole had governed the country quietly, in a business-like way, without any high ideals. Indeed, his methods were often sordid. He declared cynically that "every man has his price." That is, he thought men would always do what he wanted them to do if they were given a suitable reward, either in money, or honors, or better chances; and the growing prosperity of the country under Walpole was accompanied by a lowering of the tone of its public life.

The man who made men feel it was splendid to be British

But Pitt was a man with a loftily patriotic spirit, a genuine lover of his country, a believer in her great destiny, and in himself he was entirely incorruptible by any form of gain, whether in wealth or rank. Walpole had governed by making it worth men's while to support his plans; Pitt governed by making them feel it was the finest thing in the world to be truly British. His power came from the people's belief in him—his principles, his insight and his honesty. He was one of the greatest of Englishmen.

Walpole had kept the country peaceful by being friendly with France, but as the eighteenth century went on, the causes of friction between the French and the English in many parts of the world grew worse. Indeed, in those days friction followed trade everywhere. Nations tried to shut out the traders of other nations. As the British were a seafaring and daring people, they went wherever trade was possible and took little notice of warning restrictions. Like their Saxon forefathers, they regarded the seas as their highway, and the naval strength of their country gave them a sense of security. So, as might be expected, there were difficulties arising everywhere in those days of the expansion of trade throughout the world.

War began in Europe and spread overseas, and the chief antagonist of England was France. Great Britain, we must remember, was then a continental power, through Hanover being ruled by the English king. So Great Britain became involved.

England wrests from France the great dominion of Canada

It became clear at once that the only man fit to be at the head of the nation during a great war was Pitt—a man fearless and resourceful, and a fine judge of men, and able to inspire them with his own eager spirit. Within four years

MARLBOROUGH AND HIS MEN

A great commander, the Duke of Marlborough, on the battlefield. All the truly great military leaders of the world have had considerable power over their soldiers. As a rule, battles are not won on paper.

The sort of men who fought at the battle of Blenheim under Marlborough, who showed such consideration for his soldiers that he was able to hold together an army drawn from every nation in Christendom.

from the beginning of the war, England had become the chief European power in India, and had wrested from France the country that is now the great Dominion of Canada, besides establishing her supremacy at sea more firmly than ever.

For many years both England and France had been pushing their trade in India. Both had forts and a few soldiers to protect their interests there, and each tried, by alliances with rival native chiefs, to gain more power. When the competition reached its greatest strain and it looked as if a combination had been made against the British that might drive them away, the man for the crisis appeared in Robert Clive, a clerk of the trading company turned soldier, and he showed such daring and brilliant generalship that he gained great victories at Arcot and Plassey. French influence was utterly destroyed in India, and England gained a footing there which has extended until the whole of the peninsula is a part of the British Empire, either by direct government or by close association.

In the same way the question arose whether English or French influence should rule in the colonies which fringed the Atlantic coast of North America and extended from the Mexican Gulf up the valley of the Mississippi. France had colonized the valley of the St. Lawrence, northward of the New England British colonies, and a restless warfare had begun between the rival races, as the French showed signs of making good their claim to the land west of the English colonies, between the Great Lakes and the Gulf of Mexico. Reinforcements had been sent by France from Europe, and Pitt commissioned a young general, who was to become the famous James Wolfe, to lead a concentrated attack on the French headquarters in the fortress of the city of Quebec.

WOLFE, WHO READ GRAY'S ELEGY ON THE WAY TO TAKE QUEBEC

It was a dark night, and the oars were muffled as the English soldiers rowed to the foot of the rocky heights on which stood the French forts. As they rowed on their fateful journey, General Wolfe read quietly the beautiful poem so many of us learned at school, Gray's Elegy Written in a Country Churchyard, a poem that then was new. "I would rather be the author of that poem," said he, "than I would take Quebec." But he did take Quebec. Noiselessly his men climbed up the steep rocky path and surprised the enemy at the top, so that presently the British army was assembled on the flat plain above. Then the French, under their general, the Marquis de Montcalm, poured out of the city to drive them away.

The battle was short and fierce, and Wolfe fell mortally wounded. "See how they run!" exclaimed a British officer. "Who run?" asked Wolfe, rousing himself. When he was told it was the enemy who ran, he gave some further orders, and exclaiming, "God be praised, I die in peace," expired. Montcalm, severely wounded, died next day; Quebec surrendered, and shortly afterward all the French possessions in North America were ceded to the British. A stone on the battlefield bears the name of Wolfe on one side and Montcalm on the other. This was the beginning of the great Dominion of Canada.

The great war was being fought in Europe too, where Frederick of Prussia was England's ally against Austria and France. In 1759, the same year as Quebec, the naval victories of Lagos and Quiberon Bay made England supreme on the seas.

George II died in 1760. His grandson George III, who came to the throne, was determined to "be king," and more important in the government than his ministers. His obstinacy cost England dear.

HOW THE OBSTINATE RULERS LOST THE AMERICAN COLONIES

In the chapter Building Homes in the New Land it is fully explained that some of the first colonies in America along the Atlantic coast were once a part of the British Empire. We are now coming to the time of loss and trouble, when the first colonies broke away from the mother country and banded themselves together under governors, without a king, as the United States of America. Great Britain had to learn a lesson.

"We will not allow the British Parliament to thrust their hands into our pockets," said the colonists. Their point was that, as Englishmen, they must control their own taxation; that is to say, the amount of the taxes must be settled by their own Parliament, elected by themselves.

The obstinate and foolish rulers in power under George III insisted on the taxes being fixed by the British Parliament in London, and, sooner than give way, the colonists resolved to fight. On July 4, 1776, the United States began life as a separate and independent nation, and won the great War of Independence. This birthday is still celebrated, and ever will be. There were then about 3,000,000 people in the thirteen states of America, and thirteen stripes were marked on the flag, one stripe for each state. The flag is now made up of stars and stripes, each star standing for a state added to the Union. For mountains and rivers have been crossed, plains and valleys have been cultivated and settled, and the western boundary was ever being pushed farther back, till it reached the great Pacific Ocean. The 3,000,000 people have become about 105,000,000 since then.

But it is still an English-speaking country, and Americans love to go to the Old Country, and enjoy seeing Westminster Abbey and Shakespeare's birthplace; for both peoples have the same forefathers, and an equal share in the glories of the great past.

A GREAT EVENT THAT INFLUENCED THE COURSE OF ENGLISH HISTORY

Thirteen years after the loss of America, an event occurred in Europe which for a quarter of a century affected quite strongly the course of English history. This was the French Revolution, from 1789 onward, arising from the wretched condition of the mass of the French peasantry.

It is worth while to pause here a moment and note why it was that France had a revolution which altered half Europe for a while, and left Great Britain untouched.

In the early and middle parts of the eighteenth century France was governed by Louis XIV and Louis XV. The first was an ambitious and a strong king—the Grand Monarch; the second was a weak and luxurious and showy king. Under both there was great expense in high places and growing privileges for the rich and comfortable, while the workers were being more and more taxed into poverty and misery.

The French nation prided itself on being the leader in a luxurious civilization, while in reality it was sinking lower and lower into general poverty, and losing its place in the world, if comparison was made with the solid prosperity of countries like England and Holland.

ALL EUROPE IN THE WHIRLPOOL OF REVOLUTION

This fact was hidden under the magnificence of Louis XIV, but it could not be hidden when France was losing her hold on India, surrendering Canada, and being made to play a secondary part on the seas that were the world's highway of trade.

Though her kings and grandees were satisfied, thoughtful Frenchmen were not, and large masses of the people who were the real bone and sinew of the French nation were intensely miserable. Why should these unfair things exist? The philosophers said they ought not to exist—and France has always been rich in logical thinkers. The mind of France was increasingly in a state of rebellion, and the multitude, who had no share in the government, were in despair. Under Louis XVI, a still weaker king, with no grasp of what was taking place, matters grew worse in France, and the people rose in revolution in 1789.

ENGLAND AND SCOTLAND GROW RICHER WHILE FRANCE GROWS POORER

This roused in the French a new patriotic ardor, and with splendid bravery they turned, like a hunted animal at bay, and faced an unfriendly world.

Now let us see what the attitude of England and Englishmen was toward this great upheaval. England had never felt the bitter poverty that goaded the French into rebellion. While France had been governed despotically by luxurious kings and their favorite advisers, and had been growing poorer and poorer, England and Scotland had had a form of government that suited them very well, and they had been growing richer and richer on the whole, though changes were coming that would soon raise fresh problems of their own, and reduce large numbers of British workers to a condition little better than that of the French peasantry under the old régime.

The English, during the greater part of the eighteenth century, were a rural people living in villages, cultivating the soil, and providing what they needed locally. The landlords lived with them as neighborly squires. What we now

call manufactures were chiefly made in the village, or near by, by craftsmen who were known to all—the wheelwright, carpenter, saddler, shoemaker, weaver and blacksmith. They formed a self-supplying community, with its own traditions, amusements and individuality. Things brought from afar were dear, for roads were few and bad, and the mode of conveyance was the slow and expensive pack-horse. Only the surplus production of the village was sent away to the towns for sale, and the towns were few and small. Exchange between place and place was made largely at fairs.

JOHN BUNYAN, WHO THOUGHT IT A SIN TO ENJOY THE RINGING OF BELLS

The country population was not large compared with the amount of land available for cultivation, and there was an abundance of common land where the people had grazing rights for their horses and cows and sheep, and turf and loppings of timber for fuel. The simple means of life were within reach of all, and, speaking broadly, most of the people were unambitious and contented. Indeed, they firmly believed themselves to be the freest and most favored people in the world.

Their chief drawbacks were cruel game laws, with the death penalty always near at hand as a possible punishment for many forms of dishonesty; and a Puritan fear of natural joyousness. John Bunyan thought he was a great sinner because he enjoyed ringing the church bells.

It was a prosperous England, increasingly so under the peaceful rule of Walpole, with growing advantages as Pitt opened the world afresh to British trade; and again more prosperous as, under Pitt's son, the second William Pitt, England began, through the dawn of the age of English inventions, to serve all nations with her manufactures, till she became the workshop of the world.

THE GREAT ADVENTURER STEPS ON TO THE STAGE OF FRANCE

There were darker sides to this eighteenth-century England. Ignorance held sway in the absence of general education, an inherited national violence shown in cruel sports—for the British race has a natural rude robustness, now happily toned down in fine popular pastimes—but there was also an independence of spirit and a love of justice and fairness, and these lasting characteristics made the British people view the French Revolution first with mingled sympathy and pity, and then, when violence became frenzied, with disgust.

We can understand, then, how at first the attitude of the British people, notwithstanding the horror of the frightened royalties, was at first tolerant toward the Revolution, and never became hostile until, through the arrival on the scene of one of the greatest men in history, the relations between France and the world were transformed.

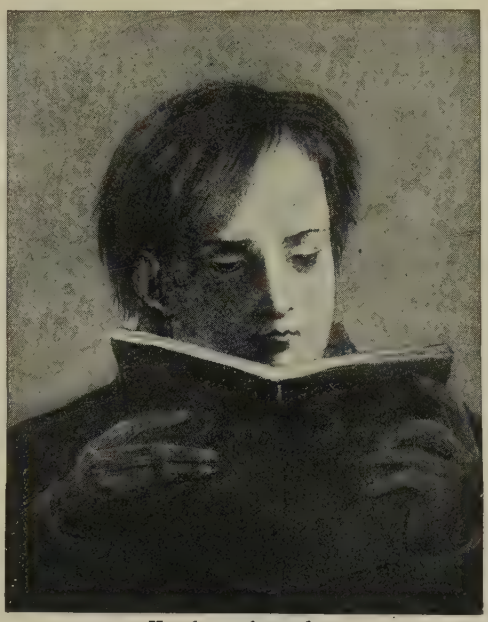
That was the Corsican adventurer, Napoleon Bonaparte, who, when the French Revolution seemed about to be crushed by the other nations of Europe, stood forward as the savior of France, able to lead her armies to victory, able to build up into a firm fabric all the liberties she had won, able to give her people a belief in the lastingness of the changes that had freed France from her oppressors, but unable to resist the temptation to do all this for his own glory, and for his own glory to make France a ruthless tyrant state crushing other countries under her heel.

The eighteenth century went out reddened by war, the opponents in the deadly struggle being England, represented in the steadfast mind of Pitt, the great commanders whom he called into service, the comrades in statesmanship whom he inspired, the allies in Europe whom he supplied with money; and on the other side Napoleon, the greatest military genius the world has ever known, who saved France from bad kings only to spoil her by his love of military glory till she threatened all the world. Other history seemed to pause until that great struggle was over.

You should turn to page 2199 in the Book of All Countries and read the story of Napoleon and of the men who conquered him. When you have done this we can continue our history of England.

All through the twenty years' war with Napoleon and whatever unfortunate country he had for the moment as his ally, England was in a curious position. The sea, patrolled by her strong fleet, kept her secure and free from invasion. The bulk of her people, all those, indeed, except actual fighting men, pursued their even way. As the United States be-

came the great manufacturer for the fighting nations during the World War, so England in the Napoleonic Wars made arms and clothes and ships for the continent of Europe. No wonder Napoleon called her a "nation of shopkeepers," and longed to wipe her out. Again and again she refitted his enemies, and with the money that she gained formed fresh alliances against him, made new loans to the country that was trying to resist him, and, finally, when the exhausted European armies needed fresh blood, English soldiers were poured across the Spanish plateaus, through the valleys of the Pyrenees and over the Belgian plains to final grips with the veteran French armies at Waterloo. The wars had another effect on England: besides increasing her efforts in manufacture and invention and her cultivation of increased corn lands, they halted progress in freedom for twenty years. War time is not an era of liberty—a soldier's first lesson is the surrender of his own will, and wartime England, with the spectacle of free France running riot in Europe, suspended many of her ancient privileges and set her face against the granting of new ones. The reform of parliamentary representation, the repeal of unfair laws against Catholics and Jews, the reform of the Criminal Law—all these questions had been raised before the end of the nineteenth century. Now, however, they disappeared beneath the smoke of guns, and did not emerge again for twenty years. Then they formed the chief interest of the Thirties and Forties.



Napoleon when a boy.
From a sketch by M. Girodet, by permission of Messrs. McClure.

THE NEXT STORY OF ALL COUNTRIES IS ON PAGE 2199.

With what different feeling from those of Wellington must Napoleon, after his exile to St. Helena, have recalled the mighty battle that sent him to his doom! Away in his rocky island home, guarded beyond the possibility of escape, he must often have sat on the lonely crag, as shown here, fighting the battle over again, correcting the blunders that led to his defeat, and wishing that the past was not beyond recall.

THE SOLDIER CLIMBED UP THE TREE

"It seems a simple enough matter," said the soldier. "But I should like to know how I am to get down inside the tree." "Fasten this round you, and leave that to me," said the witch, holding out a long rope.

THE MAGIC TINDER-BOX

CONTINUED FROM 1971

TRAMP! Tramp! Tramp!

A handsome young soldier who was returning from the wars, with his knapsack on his back, came upon an old witch standing in the road.

"Good-morning," she said. "It's a fine thing to be rich, isn't it?"

"I don't know," returned the soldier. "I'm so poor that I haven't a penny in my pocket."

The old witch came a little nearer.

"Shall I make you rich?" she asked.

The soldier almost dropped his knapsack in his excitement.

"Upon my word," he exclaimed, "I wish you would!"

"Then listen," said the witch. "Do you see that tree yonder? Go near, and you will find a hole in the trunk through which you can let yourself down into a cavern full of treasure. Within are three doors; open one, and you will find yourself in a little room. In the middle stands a chest full of copper coins, and on it sits a dog with eyes as big as teacups. But have no fear; pick him up in your arms and put him on this blue-checked apron which I will lend you, and take all you want—all you want.

"If you prefer silver, open the next door you come to, and you will find another little room. In the middle stands a chest full of silver coins, and on it sits a dog with eyes as big as mill-wheels. But have no fear; pick him up in your arms, put him on the apron, and take all the silver you want—all you want.

"But perhaps you prefer gold? If so, you must go to the third door. Open it, and you will find yourself in another room. In the middle stands a chest full of gold coins, and on it sits a dog with eyes as big as the Round Tower. But have no fear; pick him up in your arms, put him on the apron, and take all you want—all you want."

"I'm sure you're very kind," said the soldier; "but I'll warrant you'll be expecting a nice little pile for yourself!"

"Not a penny," answered the witch. "All I want is my old tinder-box, which my grandmother forgot to bring up with her the last time she was there."

"Well, that seems a simple enough matter," said the soldier. "But I should like to know how I am to get down?"

"Fasten this rope round you, and leave that to me," said the witch.

So the soldier climbed into the tree, and the witch let him down through the hole in the trunk. Down, down, down he went, until he landed safely on the floor of the huge cave, which was ablaze with a thousand lights.

He found a door, opened it, and there, sure enough, on a chest in the middle of the room, sat the dog with eyes as big as teacups. The soldier lifted the dog on the blue-checked

apron, opened the box, and filled his great pockets with copper coins.

"My word, I'm a lucky man!" he said to himself.

He shut the lid, put the dog back on the box, and went out.

Just then he caught sight of another door. Turning the handle, he went in. In front of him stood a great chest, and on it sat a dog with eyes as big as mill-wheels, just as the witch had said.

He picked up the dog, set him on the blue-checked apron, and opened the chest, which was filled with silver.

"This is worth having," said the soldier, tossing out the copper coins, and refilling his pockets with silver.

When they would hold no more he replaced the dog on the chest, and was turning to go when his eye fell upon a third door, which he opened. In the middle of the room stood a chest, and on it sat a huge dog with eyes as big as the Round Tower. The soldier was terrified, but, remembering what the witch had told him, he summoned all his courage, lifted the dog and set him on the blue-checked apron. Then he flung open the lid, and was amazed at the mass of gold coins that lay there before his eyes.

With both hands he grasped his treasure, and thrust as many coins as would go into his pockets. But they were already so full that many of them fell out about his feet.

"Why should I concern myself with silver when all this gold is mine for the taking?" he thought; and, slipping off his coat, he turned it upside down till all the pockets were empty. Then he refilled them with gold, shut the box, put back the dog with eyes as big as the Round Tower, and made his way to the foot of the tree-trunk.

"Don't forget my tinder-box," called out the old witch from above.

"That's just what I have done," said the soldier, turning back.

He found the box, and was pulled up through the tree.

"What do you want with this old box?" asked the soldier, as he stood once more beside the witch. "It must be very valuable."

The old woman made no reply, but kept her eyes fixed on the box.

"Tell me the secret of the box—for I am sure there is one—or I will certainly cut off your head," said the soldier.

"Give me my tinder-box!" screamed the old woman. "You have gold enough, would you rob me of my box?"

"Yes," replied the soldier brutally; for by this time he was sure that she was a wicked old witch who wished to do harm. So he picked up his knapsack, left the witch and made his way to the nearest town.

Here his money brought him many friends. He lived in a fine house, and had a number of servants to wait upon him. For a long time, indeed, he lived gaily in great style; but at last there came a day when his money was all spent, and he was forced to move into a tiny room in the poor part of the town.

As he was sitting alone one evening in the dark—for he was too poor to afford a light—he suddenly remembered the old tinder-box. He dragged it from where it lay almost forgotten and opened it, and at the bottom, to his delight, he found a piece of flint. He struck it against the box, but no sooner had the spark appeared than the door of the room flew open, and in burst the dog with eyes as big as teacups.

"What commands has my master for his slave?" said he.

The soldier was amazed.

"My word!" he thought. "Then this must be the secret of the tinder-box. It will evidently bring me whatever I choose to ask for."

"Bring me money," he said aloud, whereupon the creature vanished, and in a few minutes he was back again, holding in his mouth a large bag full of money.

Soon the soldier found out that by striking the flint once the dog that sat on the copper chest came to him; by striking it twice the silver dog appeared, and by striking it three times he could summon the guardian of the gold treasure.

That day there was no happier man in all the town. He returned to his grand house, and once more lived a life of gaiety, and had everything he wished for.

Now, in this town there lived a beautiful Princess. It had been foretold that she would one day marry a common soldier, and this so enraged the King that he locked her up in a great copper palace, and allowed no one to visit her but himself and the Queen.

When the soldier heard this story he determined to see the beautiful Princess,

come what might. So, summoning the dog with eyes as big as teacups, he bade him bring the Princess without delay.

The dog obeyed, and in a short time appeared with her fast asleep on his back. She was so beautiful that the soldier bent over and gently kissed her hand, and then bade the dog take her safely back to the palace.

The next morning the Princess told the Queen that she had had a strange dream. She had dreamed she was riding on a huge dog, and was taken to a soldier who kissed her hand.

"A pretty dream, indeed," thought the Queen. "I'll find out where she goes."

That night she fastened a little bag of flour to the Princess's waist; but before she went away she took out her gold scissors, and made tiny holes in the bag, so that if she moved about the flour would drop out, and mark the road along which she traveled.

This is just what did happen. The soldier had fallen in love with the beautiful Princess, and that night he again sent the dog to bring her to him; and all the way along, as the dog ran from the palace to the soldier's house, the flour dropped out upon the roadway.

The next morning, when the Princess said: "I had that strange dream again last night, I wonder what it can mean," the Queen rose quickly, and went to the window from which she could see the roadway. And there, sure enough, was the little line of white.

Summoning her servants, she bade them follow that white line, and arrest the man to whose house it led; and so, before an hour had passed, the soldier was arrested and cast into prison.

The next day he was to be executed, and as he was sitting in his cell waiting for the guard to come for him, he thought how different things would have been if only he had had time to bring away his tinder-box. Just then his eye fell upon a little shoemaker's apprentice who was passing the window.

"Hi, boy!" he cried, starting up. "Fetch me my tinder-box, and I will give you a gold piece for your trouble."

Away ran the lad in great glee, and soon returned with the magic box. From that moment the soldier knew his troubles were over. But he allowed the soldiers to lead him to the gibbet, and then when the King and Queen and the whole court were assembled, amid a great crowd of people, to see the execution, just when, in fact, the executioner was on the point of fitting the rope round his neck, the soldier turned to the King, and said:

"Will it please your Majesty that I should smoke one pipe before I die?"

He spoke so courteously that the King consented; and then, in an instant, the soldier drew out the tinder-box. He struck it once, he struck it twice, he struck it three times, and suddenly all three dogs stood before him—the dog with eyes as big as teacups, the dog with eyes as big as mill-wheels, the dog with eyes as big as the Round Tower.

"Protect me! Protect me!" cried the soldier. "Don't let them hang me!"

Up sprang the three dogs, and in an instant there was a wild scene such as had never before been witnessed in that city. The dogs dashed in among the people, scattering them far and wide. The dog with eyes as big as the Round Tower flew at the King and Queen, and tossed them high into the air. They were not much hurt, but they were very much frightened by the great dog.

Then all the people shouted with one voice:

"We will have the soldier for our King. Set him on the throne, and put the gold crown upon his head. He shall marry our Princess, and rule over us."

They flocked to the gibbet and released their hero, while a party of soldiers marched to the copper palace to escort the lovely Princess to the heart of the city, where all the people eagerly awaited her. As the procession came in sight, they burst out into prolonged cheers, so that it was some time before the Lord High Chamberlain could make his voice heard. And when he announced that the Princess had consented to marry the soldier, they clapped their hands and cheered till the streets echoed.

The next day there was a royal wedding. The soldier married the Princess, and they lived happily together all their lives.

The three dogs, although usually invisible, had royal privileges whenever they were summoned by the soldier, and forever after in that kingdom everyone strove to get dogs with large eyes. No one knew how much the three dogs were worth to the soldier, but they suspected that they were more than defenders.

HOW GOTHAM GOT A BAD NAME

EVERYBODY has heard of the Wise Fools of Gotham. But perhaps we do not know who these men were, or what is meant by "Wise Fools."

This is the story: Gotham is a village in Nottinghamshire, England, and one day King John, marching toward the town of Nottingham, commanded that his retinue should pass through Gotham meadow. Now, it was popularly thought that any land over which the king passed became ever after a public road; so the men of Gotham, who valued their meadow, took steps to prevent King John from crossing that way. The king, angered by their proceedings, sent his officers to conduct an inquiry in the village.

When the officers arrived, they found some of the men shouting and making a tremendous din over a pond. These noisy fellows had an eel on a string, and were trying, so they said, *to drown it in the pond!* Others were found rolling cheeses down the road—giving them a push and letting them bowl along of their own accord. They were sending their cheeses, they said, to Nottingham Market. Others, in a tremendous hurry, were dragging carts and wagons up a hill. They were going to shade a wood, they said, from the hot rays of the sun. And others were building a hedge round a bush on which a cuckoo had settled, to prevent the bird from flying away.

The officers went away half amused and half disgusted, and reported that Gotham was a village of fools utterly beneath the king's notice.

But others, who knew more of the story, said that there were some very wise fools in Gotham, and so the phrase came to signify folly which was put on for a wise purpose. It was really a compliment to Gotham, not a sneer. A charming old English writer, named Thomas Fuller, says: "Gotham doth breed as *wise* people as any which causelessly laugh at the simplicity."

LA JEUNE FEE DU LAC VAN

THE ENGLISH VERSION OF THIS STORY IS GIVEN ON PAGE 5441.

UN jeune berger de Mothvey gardait ses moutons, une après-midi, près du Lac Van, dans les Montagnes Noires du Pays de Galles, quand trois jeunes fées sortirent de l'eau et se mirent à jouer sur l'herbe. Toutes trois étaient belles d'une beauté surhumaine, mais la plus jeune était la plus adorable; et le berger tomba éperdûment amoureux d'elle et réussit à la faire consentir à devenir sa femme. Le jour du mariage, la fée sortit du Lac Van apportant, en fait de dot, trois vaches, deux bœufs et un taureau, et la noce fut joyeusement célébrée à l'église de Mothvey.

"Et maintenant," dit la fée à son mari, "rappelez-vous que si vous me frappez trois fois sans raison, je serai obligée de retourner au Lac Van."

Le berger dit que jamais il ne ferait chose pareille, et ils vécurent heureux ensemble et eurent trois fils. Mais quand le berger pria sa femme d'aller chercher un cheval pour se rendre au baptême, elle oublia de le faire, et, sans penser à sa menace, son mari lui frappa l'épaule en lui disant de faire ce qu'il lui avait demandé.

"Une fois," dit la fée.

Bientôt après, ils allèrent à une noce et au lieu de s'amuser, la fée pleura tout le temps, comme si elle avait été à un enterrement, et tout le monde était attristé.

"Pourquoi pleurez-vous?" dit le berger en la frappant sur l'épaule.

"Parce que le mariage ne sera pas heureux," répondit-elle. "Et faites attention! Vous m'avez frappée deux fois déjà."

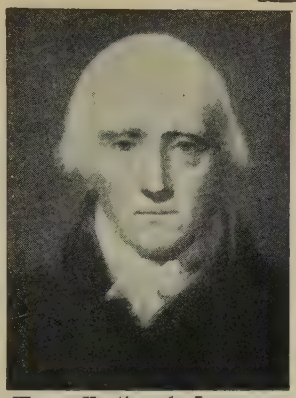
Le berger devint très prudent car il tenait à ne pas perdre sa femme, mais plus tard, à un enterrement, elle scandalisa tout le monde, en riant et en dansant. S'oubliant complètement, le berger la frappa en disant:

"Est-ce le moment de s'égayer?"

"Oui," dit-elle. "L'enfant a échappé aux douleurs de ce monde et est entré dans le Royaume des Cieux. Mais vous m'avez frappée trois fois. Adieu!"

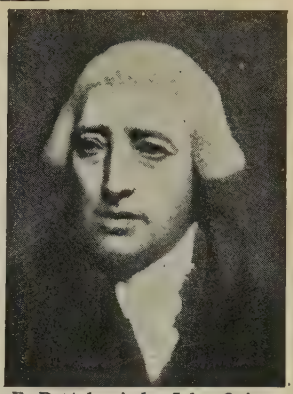
Quand elle pénétra dans le Lac Van, ses bestiaux l'y suivirent. Cependant, quand ses trois fils furent grands, la fée réapparut et leur donna le pouvoir de guérir et ils devinrent tous trois de célèbres médecins.

THE NEXT STORIES ARE ON PAGE 2221.



Warren Hastings, by Lawrence.

A Lady, by Allan Ramsay.



F. Bartolozzi, by John Opie.

THE GOLDEN AGE OF BRITISH ART

CONTINUED FROM 2082

YOUNG as was British art in the eighteenth century, during the second half of the century England's portrait-painters held a place in the very front ranks of contemporary European art. Their fresh, unworn lustre shone the more brightly in a period that elsewhere was rather dim. Foremost on the roll of these painters of portraits stand two names side by side—Sir Joshua Reynolds and Thomas Gainsborough—for the owners of the names lived near together and knew each other, and painted famous likenesses of many of the same famous men and women. Reynolds was four years old when Gainsborough was born, and he lived four years after Gainsborough's death.

The genius of Reynolds and the genius of Gainsborough were of such different strains that they seem each to supply what the other lacks. While Reynolds was an eager student of art in books and in the works of the greatest painters, traveling abroad and copying their pictures in foreign galleries, until he became a truly learned connoisseur, Gainsborough gave himself to nature as to the supreme teacher and never traveled outside his native island, going back again and again to the woods and fields he loved best. Reynolds was a thinker, of keen, acute, well-balanced mind. He sought and learned how to get the results he wished. Gainsborough *felt* what he wished to express, and it came through his brush naturally or not at all. Reynolds was systematic and industrious, planning out his time and carefully observing his own regulations. Gainsborough followed his impulse; he might stand unoccupied for hours looking from the window of his studio, dreaming of beauty. His muse would not be driven. Therefore, although Reynolds left about four thousand paintings, Gainsborough can be accredited with not more than three hundred, and of these about eighty are landscapes. To both men we give our admiration—to Reynolds for his fine, deep color, his warm but subtle tone, his skillful and understanding way of presenting the figures and the personalities of his sitters; to Gainsborough for the soft, elusive, haunting beauty of scenes and forms in which we perceive his own tender wistfulness mingling with the unspoiled charms of nature's self.

Joshua Reynolds (1723–92) was the son of a learned clergyman of Devonshire who kept a grammar school. It was there that Joshua studied as a boy, although he spent much of the time that was due to Latin and mathematics in dreaming or

eagerly getting all that he could out of a few books on the principles of art. And because his drawings showed unusual skill and a mastery of the points he had studied out for himself, he went at the age of nineteen to London to study with a painter who was then a favorite but whose work has no value to us now. In a few years the young man confidently established himself in an independent studio. Then he had the great fortune to be offered a trip to Italy.

SIR JOSHUA REYNOLDS, FIRST PRESIDENT OF THE ROYAL ACADEMY

Among the paintings of the Italian masters in the galleries the young Englishman walked, disappointed and dismayed because he could not feel their force and beauty as he had anticipated. But devotedly he studied and copied until he gained what he had lacked, and when he returned to England his knowledge of European painting was broad and discriminating. He was an authority. Immediately favor turned toward him. People flooded him with requests for portraits, and it was not long before he had a large house in London, with a luxurious studio, where he painted industriously from eleven until four every day. From that hour on he gave himself to social life, entertaining freely the most interesting and distinguished men of the time. Garrick the actor, Goldsmith the writer, Burke the statesman, and Dr. Johnson the philosopher were a few of his intimate friends, portraits of whom he has left us. At his balls the best society of London came together, for he was as noted for his distinction of manner as for his excellence in his art.

In 1768, when the Royal Academy was instituted, he was at once chosen as its president. Then he was knighted by George II, who later made him painter to the king. The last word of his last public address was by intention the mighty name of the artist who was his greatest admiration — "Michelangelo." When Sir Joshua died he was honored in every possible way. You may read more about his life on page 2332.

Reynolds had remained a bachelor, with a sister to help keep his house; but who has painted pictures of childhood that we remember better or more affectionately than some of his? Groups of little ones with their mothers, like that of Lady Cockburn and her children; portrait studies, like Master Hare and Little Miss Bowles with her dog; and others, like the Age of Innocence, and the cluster of Angels' Heads, which are really five different studies of the one darling little head of Frances Isabella Gordon. Both of the last two pictures are in the National Gallery, London. The painting of Master Hare can be seen in the Metropolitan Museum in New York, where there are several other Reynolds portraits. Many of his works are in the Royal Academy and the National Portrait Gallery in London; but numbers of them are in private collections in both Europe and America.

Sir Joshua, by experimenting in the production of the colors he most desired —warm browns and reds—used some materials that were not lasting, so that in some cases the paint cracked and sometimes even fell from the canvas. Thus a few of his paintings have been lost. He loved to give his portraits a grand manner, with heroic or historic feeling. And for pleasure he painted historic compositions. In the portrait of the actress Mrs. Siddons as the Tragic Muse we can trace his intelligent admiration for Michelangelo's style. In others we can feel the influence of Correggio, Raphael, Leonardo, Murillo and others. He did not imitate, but he had absorbed. Hogarth said: "There is only one school, that of nature." Reynolds said: "There is only one doorway to the school of nature, and of that the old masters hold the key."

THOMAS GAINSBOROUGH, WHO LOVED HIS NATIVE COUNTRYSIDE

Thomas Gainsborough (1727–88) was another English lad who neglected study for love of drawing and for love of the outdoor world, as you will see if you read of his life on page 2331. Always a dreamer and impulsive in his tendencies was Gainsborough; and his expression in line and color was spontaneous and free. Reynolds had moved with ease in a sphere of large experience in life. Gainsborough, more shy and retiring, had to be drawn into prominence. Although at fifteen he went to London to study, when three years afterward he began his career as an independent artist it was back in the retirement of his old haunts.

He loved a quiet life in his own home, with his wife and his music and his dreams. He loved the familiar countryside of his boyhood, where meadows, trees

and streams had sung to him and given him his first visions of beauty. There he lived and worked for fourteen or fifteen years before going to Bath, where he became popular as the portrait-painter of fashionable beauties and of royalty.

When he painted his rare portraits of lovely women he set them in an atmosphere of naturalness, for he seems to have perceived within them the impulses and feelings that belonged to them as human beings. His own sensitiveness helped him to catch vibrations from their hidden selves. A gentle melancholy and a brooding tenderness breathe lightly through the delicate colors with which the artist made his record of the impressions that came to him from his sitters. His pictures of children—whether peasants or gentler-born—show them moving with natural freedom through the light and air of out-of-doors. Among the most valued of his portraits are that of Georgianna, Duchess of Devonshire (now in America) and that of the Honorable Mrs. Graham (in the National Gallery of Scotland in Edinburgh). For the most part his works are in private collections on both sides of the Atlantic.

Characteristics of two great portrait-painters compared

Sir Joshua Reynolds held that "the chief masses of light in a picture should always be of warm, mellow color, and that the blue, gray or green colors should be kept almost entirely out of these masses." Whether or not, as has been said, Gainsborough deliberately took this as a challenge, he produced some most striking and beautiful pictures in which blue, gray and green form the central and dominant notes. Of these the most famous are his portrait of Mrs. Siddons in a blue-and-gray-striped gown and the picture known as the Blue Boy. In the latter—now in California—a charming boy in a costume of rich, pure blue stands out engagingly before a background of brown and green landscape.

As a rule, Gainsborough's color is tender, soft and cool, greens and blues and grays and delicate yellows predominating; although in his landscapes—which he loved best of all to paint—he introduced warmer tones, rich browns and sometimes red. The landscapes show the same natural way of looking at things that we have noted in the portraits, the same originality of treatment. They are quiet in tone and feeling, with something of mystery or melancholy in their clouded skies or in the forest shade. They were made for his own pleasure, and few of them were sold during his lifetime. Appreciation of their value has grown with time, and they are considered the first examples of landscape showing a modern realistic treatment.

Gainsborough had not the reliable and cultivated correctness of Reynolds; but grace and spontaneity are in all his works—a peculiar distinction due to his faculty for seeing beauty in all simple things. "He had beauty in himself, and all his life it fed on simple delights."

Sir Joshua Reynolds' tribute in an address after Gainsborough's death held a prophecy which has been fulfilled. "If ever this nation," he said, "should produce genius sufficient to acquire to us the honorable distinction of an English School, the name of Gainsborough will be transmitted to posterity, in the history of the art, among the very first of that rising name."

George Romney, greater in gift than in character

In George Romney (1734–1802) we come to an artist whose gift was great enough to make him a rival of Reynolds, but who had not the steady will, the resolution, in using his gift to carry it to the high performance for which it was fitted. In control of line he surpassed even the greater men, and his color and vivacity give his pictures true charm. While he did not make elaborate plans of composition, he had a natural ability for placing his figures so as to give a beautiful arrangement of masses and lines. The background is usually plain, laying the more emphasis on the portrait itself.

Romney's faults are due to defects of character and to insufficient early training rather than to lack of genius. He had a tendency to lay plans larger than he could carry through, and in his later life this became almost a form of insanity. With one undertaking partly accomplished, he would turn from it to some new delightful project that beckoned. Had he possessed a firmer will, he would no doubt have reached great results.

Although his best work is to be seen in some of his portraits (chiefly in private collections), he painted, besides, historical and ideal scenes. His interesting and sad story is told on page 2334.

In Scotland Allan Ramsay (1713–84), a contemporary, you see, of the English painters of whom we have been thinking, painted portraits of many Scottish gentlemen and ladies which made his name well-known in England as well as at home. While his color is sometimes hard and opaque-looking, his drawing of the features is fine, and his pictures are marked by a grace that is characteristically his. The portrait of his wife on page 2115 is one of his most charming portraits. The latter part of his life was spent in England, where he became court painter to King George III.

Henry Raeburn (1756–1823), another Scottish painter, in childhood left an orphan and early apprenticed to a goldsmith, learned for himself the arts of miniature- and oil-painting. Possessed of the very qualities that Romney had not, he lost no opportunity of improving his knowledge and technique. Scotland owes to this son of hers admirable portraits of many others of her honored children, including Sir Walter Scott. They are sincere and forceful likenesses, broad and well handled, somewhat crude in color and tone, but interesting in their vigor and power of characterization. Of Raeburn's romantic marriage, which opened the way to study on the continent, you may read on pages 2330 and 2331. He became president of the Society of Artists in Edinburgh and, before his death, was knighted by the king. His portraits are in the National Galleries of Scotland and England and in a number of other public and private collections. One of the finest is that of Sir John Sinclair, shown on page 2115.

Among the lesser portrait-painters of the period in England we shall speak of three—Hoppner, Opie and Lawrence.

John Hoppner (1758–1810) confessed himself to be a follower of Reynolds; and though he painted some landscapes and pictures on ideal subjects, his portraits, especially those of women and children, are considered his most successful works. They are still sought and treasured, although time has dimmed the beauty of their coloring. An attractive example of his portraiture is the group of the Sackville children on page 2118. Hoppner was a man of social accomplishments, who could count among his sitters members of the royal family and such celebrated persons as Sir Walter Scott, Wellington and Lord Nelson.

Mrs. Gardiner and Her Children, by John Hoppner.
Photo, courtesy Metropolitan Museum of Art.

John Opie (1761–1807), when as a young man he went to London from his native Cornwall, became the fashionable portrait-painter of the town, hailed as the self-taught, independent artist. After the wonder had subsided and he was less pressed with orders, he worked hard to learn how to overcome his faults, and divided his time between portraits and historical canvases. His pictures have far more vigor of treatment and more individuality than elegance and grace.

In Sir Thomas Lawrence (1769–1830) we come to the successor of Sir Joshua Reynolds in the post of painter to the king. Of Lawrence's talent as a boy, his early fame, and his election to the Academy at the age of twenty-one by especial favor, you read in the story on page 2335. Having started so young to observe and record the forms and features of society, he became very skilled in reproducing the airs and graces of its ladies and gentlemen. He drew well and painted in an easy manner, using a brilliant coloring that was sometimes hard in effect. Of all that he produced his pencil and crayon studies are rated as the most successful.

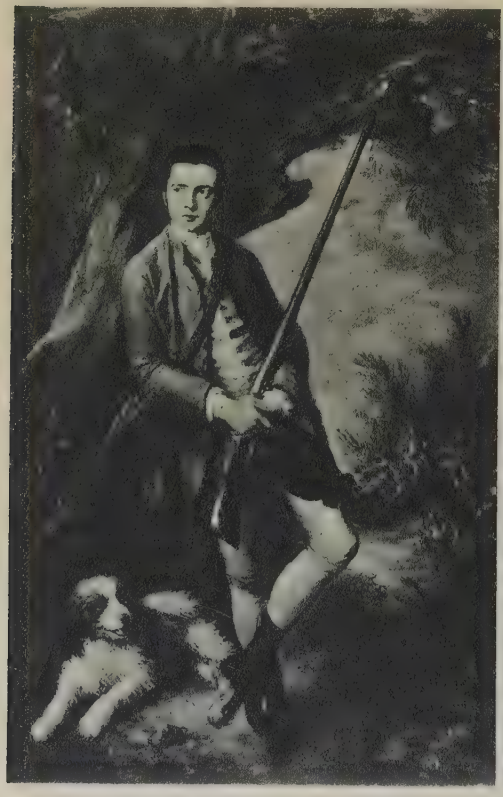
THE NEXT STORY OF THE FINE ARTS IS ON PAGE 2229.

REYNOLDS' FAMOUS PORTRAIT OF MRS. SIDDONS AS THE TRAGIC MUSE

From the collection of Henry E. Huntington of California. Some of the pictures on these pages are reproduced by courtesy of Lord Rothschild and Sir Edward Stern, Bt.; photographs of the paintings are by Messrs. Braun, Hanfstaengl, Mansell, the Metropolitan Museum of Art, and others.

MR. AND MRS. LINDOW, BY ROMNEY

MRS. MARK CURRIE, BY ROMNEY



MR. POYNTZ, BY THOMAS GAINSBOROUGH

LADY GOWER, BY SIR THOMAS LAWRENCE

ALLAN RAMSAY'S PORTRAIT OF HIS WIFE

LADY CRAVEN, BY GEORGE ROMNEY

SIR JOHN SINCLAIR, BY RAEBURN

RAEBURN'S PORTRAIT OF A LADY

MRS. JORDAN AS THE COMIC MUSE, BY JOHN HOPPNER

LAVINIA, COUNTESS SPENCER, BY SIR JOSHUA REYNOLDS

PORTRAIT OF MASTER HARE, BY REYNOLDS

LADY GEORGIANA SPENCER, BY GAINSBOROUGH

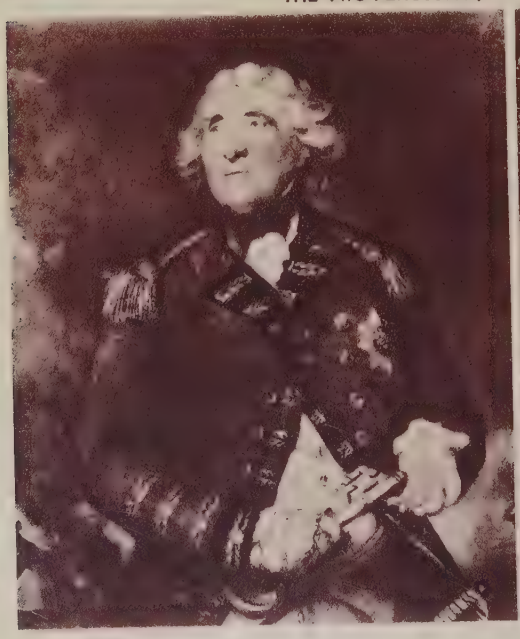
THE SACKVILLE CHILDREN, BY JOHN HOPPNER

LORD ALTHORP, BY REYNOLDS

A BOY WITH A KID, BY LAWRENCE

THE MARSHAM FAMILY, BY GAINSBOROUGH

THE TWO FERGUSONS, BY SIR HENRY RAEBURN



LORD HEATHFIELD, BY REYNOLDS

HOPPNER'S PORTRAIT OF GEORGE IV

WERE ALL FLOWERS ONCE WILD?

CONTINUED FROM 1811

CERTAINLY all flowers did once grow wild—and all animals, too. There are certain kinds of flowers and animals which men have developed by choosing the kind of thing they wanted and leaving the rest, and so gradually getting such things as the garden rose, the pouter pigeon, and so on.

These are what we call *cultivated* varieties, but all of them, even the most curious and newest orchid, or pigeon, or breed of dog, have been made from wild or natural forms; and, of course, before man started doing this, all flowers, all plants, all animals were wild. Even now, if we are careless, our garden plants will return sometimes more or less completely to their natural state, and so will domestic animals. On the other hand, cultivated flowers may escape from a garden, as we say, their seeds being carried by insects or the wind, and may then appear to have grown wild.

There are many plants found in field and roadside to-day which are not really natives of our country at all, but have escaped from some cultivated ground and thrived in their new surroundings. The snow-berry, the beautiful shrub so much admired in English gardens for its round, snowy white berries, was introduced from North America, but is found wild in many parts of the country, and is sometimes included among the wild plants of Britain. The shrubby rocket, a relative of the wild mignonette, came from Europe. It is cultivated in gardens, but in many places has escaped, and is found as a wild plant. On the other hand, the fragment mignonette which we grow in our gardens as a cultivated plant is a native of Egypt, and is there found growing wild. Some of our prized flowers are troublesome weeds in other countries, or other sections of our own country.

Cultivated plants that run wild and no longer receive the care of man gradually revert to the form of their wild ancestors. The most beautiful and varied pansies of the garden, if allowed to grow untended in a neglected corner of the garden, gradually get smaller and smaller, and more like the common heartsease of the field.

There is no end to what we might do by cultivating plants and flowers. Men used to try only to make beautiful forms, but in recent years they have tried to make useful ones, and have succeeded, especially in making from old kinds of grain new kinds which are far more valuable for human food. From the dangerous prickly-pear a valuable edible cactus without spines or prickles has been produced. This enables large numbers of cattle to be reared in otherwise foodless desert regions of the world.

WHY DO OUR VOICES SOUND HOLLOW IN AN EMPTY HALL?

We can almost guess the right answer to this question for ourselves if we begin by asking ourselves why we use the word "hollow" to express the sound of our voices in such a case as this. The truth is that this is the kind of sound that is produced within any hollow or more or less rounded space; and, by a rather absurd use of language, we have come to call the kind of sound produced in a hollow space a hollow sound. Now, we must ask what it is that gives this character to the sound. It is that the sound is reflected back from the sides of the space where it finds itself, and it is this echo that distinguishes it.

Exactly the same thing makes the difference between our voices on the level in the open air and in an empty room or hall. The reason why furniture and people and hangings help so much to deaden the sound in a room is that these things either have very irregular surfaces, which break up the sound-waves and do not reflect them truly, or else they are made of materials which are soft and not elastic, and therefore simply absorb the sound.

IS THE EARTH GETTING SMALLER ALL THE TIME?

Yes, but we must understand what we mean by smaller; we mean actually smaller, and not less heavy, for that is another question. The earth might get smaller by shrinking without losing any of the stuff which makes it, or it might get smaller because part of the material of which it is made has been lost. It might shrink smaller, or wear smaller, so to speak.

We are certain that the earth is shrinking smaller, because we know it is slowly losing heat and getting colder, and if it does this it is bound to shrink. We suppose the great cause of earthquakes is the shrinking of the inside of the earth as it cools, so that the crust on which we live is left not sufficiently supported.

As regards the possibility that the earth is wearing smaller, we cannot doubt that it does slowly lose a certain amount of the gases of the atmosphere by a sort of leakage from the outside layers. But, on the other hand, certain things reach the earth and add to its amount from outside space; and, for all we know, the earth may be actually gaining more in this way than it loses in the other way.

It has been known for many years that the earth lives in a more or less constant shower of meteors, and these become part of the earth when they reach it. That is true whether they reach the solid ground or whether they are burned up in the air. Also, we now believe that the sun is always shooting out tiny particles called electrons, and our earth catches a vast number of these.

WHY DO DARK THINGS LOOK SMALLER THAN LIGHT THINGS?

When we see a dark thing against a light background or a light thing against a dark background, it is really only the light that we see. We see a perfectly dark thing only by contrast with the light around it; and if the light around it were not there, we could not see it at all. We cannot see darkness. Now, it is an interesting fact about the eye that when any part of it is excited by light, the effect of the light spreads a little round the edge of the part of the eye on which the light falls. It is as if the light at the edge of it radiated sidewise, and so it is called *irradiation.*

When we see a black spot on a piece of white paper, this process of irradiation makes that spot appear smaller than it really is. All around the edge of the part of the eye opposite the spot, and on which the light is not falling, a little of the effect of the light from the white paper is being felt. When we see a white spot on a dark background, irradiation works outward from the white spot into the part of the eye which is really opposite the dark, and the white spot looks bigger than it really is.

IS THERE ANY WATER IN THE SUN?

We are quite certain that there is no water in the sun. We know that both oxygen and hydrogen exist in the sun, as they do in the earth, and we cannot doubt that, as they have a great attraction for each other here to form water, they must have a great attraction for each other there. Yet there can be no water in the sun because the sun is so hot that none of the elements, not even oxygen and hydrogen, can combine there. By producing intense heat we can force the oxygen and hydrogen of water apart, and that is what happens in the sun; or, rather, the sun has never been cool enough to allow them to come together, and so there can be no water produced.

HOW DO THE STEEL STUDS GET INTO A TIRE?

The main purpose of steel studs in the tread of a motor tire is to prevent the tire from skidding, and they are subjected to friction and road-shocks which would soon tear them out if they were not fixed in firmly. In some tires they are fixed in leather bands in the cover, but in others they are imbedded in the rubber in a very ingenious way.

The stud itself is like a miniature footstool made in two separate pieces, with a flat top and legs that curve out, then in, and out again at the bottom. The leg is imbedded in the rubber tread of the tire, and takes a very firm hold, but still allows the stud to yield a little to any specially heavy straining it may receive when in use on the road.

The stud of a tire.

First a band of lead is prepared to cover the surface of the tire, and in it a series of holes is punched, each hole having a slight lip at the top. The heads of the studs are inserted in these holes and pressed home gently, so that the lip grips each stud. The lead band is now bent to form a circle, and the ends are joined so that the legs of the studs are all pointing inward. It is placed in a circular tire mold, and the soft rubber cover is then molded under pressure, with the result that the rubber covers the stud roots, which become firmly imbedded. The cover is then vulcanized so that it becomes quite hard; and finally it is taken out of the mold, and the lead sheet stripped off, leaving the heads of the studs projecting from the surface of the tread of the tire.

HOW DO WE KNOW WE HAVE DREAMED WHEN WE WAKE UP?

After all, this question, when we come to think of it, is only one of memory. We remember some of our dreams much more distinctly than others. A dream is an experience of a special kind; it is something happening in the part of our brain which has to do with consciousness and experience, and the brain's general power of memory applies to this as it does to other cases. But, of course, the brain is in a peculiar state when we dream. The whole of it is not working, and so our recollection of dreams is not as good as that of our waking experiences. The more clearly we remember a dream, the greater must have been the part of the brain machine that was working at the time; and, on the other hand, there is no doubt that we have many dreams which we do not remember at all when we wake, and which were due to the working of only a very small part of the brain. We see from this that we can judge which dreams are the best kind to have, if we are to have any at all. Probably even little babies have dreams, though we cannot be entirely sure.

The more definite a dream is, the more vivid it is, and the better we remember it. The more awake our brain was when we dreamed, the less was the rest it was getting, the poorer and less valuable was our sleep. But when a dream is scarcely remembered, or not remembered at all, and when it is very faint and vague, then our brain was much less awake during the dream and our rest and sleep were so much the less disturbed.

WHY DOES A LUMP RISE IN MY THROAT WHEN I CRY?

The throat is a very wonderful and delicate place, with certain ways of its own that have to be carefully studied. Doubtless the reason why it is so delicate and can do such curious things is that it is, in human beings, the place of speech. So, often, when people's minds and brains are not quite in order, especially in the case of youngish people, we find that they have difficulty in speaking and swallowing, and especially that they think they feel a sort of ball, or globe, rising up in the throat.

This has been known for many centuries, and this globe—only it is really not there at all—has a long Latin name. Now, when we cry we are rather in the same upset state that hysterical people are in; and, indeed, in both cases the great fact is that the person has lost his or her self-control, and the brain is not rightly looking after the doings of the body.

The special explanation of the globe feeling probably lies in the fact that the throat is really a wide tube made with walls of muscle. When we swallow, a sort of wave runs along this wide tube from above downward.

When we are upset, as when we cry, the machinery gets out of order, so to speak, and probably the tube starts moving when it should not, and as it should not—from below and upward. This makes us feel as though a ball, or globe, were rising up in the throat.

SHOULD WE HAVE PLANTS IN A SICK-ROOM?

As long as there is sunlight it is very good to have plants, especially with plenty of green leaves, in a sick-room. They are beautiful, and that is good. Most wall-papers with patterns on them are enough to drive an invalid crazy; but when the eye falls on green leaves it is always soothed and cheered. But a more important reason is that the daylight acts through the green stuff of the plant to make fresh oxygen in the air of the room by breaking up the carbon-dioxid gas which the ill person breathes out from his lungs. Plants in the daytime help to ventilate the room.

HOW CAN A DONKEY EAT A THISTLE, THORNS AND ALL?

If you will take the trouble to look carefully into the mouths of different animals, you will find that the inside of the mouth differs widely according to the kind of food the animal lives on. In your own mouth the lining is quite soft and easily injured. In some animals the membrane which lines the mouth is extremely tough, and is covered with thick scales, enabling the creature to crush foods which would injure a tender mouth. This is the case, to a certain extent, in cattle and in all animals that feed on hard kinds of grass. The donkey's mouth is an example.

WHAT CAUSES THE CHANGE IN COLOR OF THE SEA?

On a black night, when there is no light for the sea to reflect, the sea looks black. When the sky is gray, the sea reflects the light that falls on it and looks gray. The color we usually think of as the color of the sea is blue, because the sky is blue, or ought to be; and, if blue light falls on it, it is blue light the sea reflects. Yet sometimes the sea is green, though the sky is never green.

Parts of the sea are shallow, especially near the shore. They may be so shallow that some of the light from the sky may pierce the water, reach the bottom and be reflected from it to our eyes. So, of course, the light will be changed, partly according to the color of the bottom of the sea, and partly because of the greenish tinge of sea-water itself. Besides all this, we have to remember that the same part of the sea on a coast we know well may be of a different color on different days, even though the water is the same and the color of the bottom is the same, because the sun is clouded or is in a different part of the sky, and the light strikes the bottom differently. There are many different things that will affect the color of the sea, and that is why its color changes so much and so often.

WHY IS IRON-ROOFING USUALLY CORRUGATED?

Corrugated iron is a very cheap and convenient material for roofing, and it is specially designed also for keeping out the wet. The nails that keep the roof in position are not put through the gutters of the iron, but through the rising part. So, as the rain runs down the gutters it does not eat away the holes of the nails and get through the roof. Iron in this shape is also easier to handle.

WHY IS WALKING EASIER ON A ROUGH SURFACE THAN ON A SMOOTH ONE?

The answer is that roughness, whether it is on the ground or on the soles of our boots, means friction, and without friction we cannot walk. Friction, or rubbing, means that the boot cannot slide along the surface of the ground, but stays without difficulty wherever we put it. So walking is easy.

WHY DO OUR HANDS BECOME WARM AFTER PLAYING WITH SNOW?

It is wonderful that our hands should become warm after playing with snow, for the cold snow must take heat away very quickly.

The warmth of our hands is derived entirely from the blood, except at times when something hot is actually shining on them. Therefore a much larger amount of blood than usual must be flowing through our hands. The blood is no warmer in itself, or the whole of the body would at once notice it. But what happens is that the hands are getting a richer and quicker supply of blood to make them warm.

The effect is the same as the delightful glow we feel after a sea-bath. The brain has the duty of taking care of the skin, as of every other part of the body. When the skin has been chilled, its life has been heavily taxed, and it will suffer unless it is compensated. So the brain orders the small blood-vessels in the skin, wherever it has been chilled, to relax and widen so that the warm blood is able to circulate quickly through them.

WHY ARE BLIND PEOPLE SO QUICK AT HEARING?

The simplest answer to this question would be to say that blind people listen more attentively to the sounds around them. An ordinary person who has all the senses of sight, smell, touch, hearing and taste receives a tremendous number of impressions from all sorts of sources, which are conveyed to his brain by special nerves and give him the ideas which he identifies with all those sensations. Now, if one of these brain-centres should be absent, the brain has fewer messages to attend to, and so has more time for the rest.

Thus, in a blind person there are no means of his getting all the information which comes to an ordinary person through sight, so that if he wants to know how near he is approaching to somebody walking toward him, the only means he has of judging that is by listening to the sound of the footstep. He cannot see the distance which separates the two. In this way be becomes accustomed to listen deeply for all the sounds around him, many of which he would otherwise not hear at all; and so we find that blind people become extremely quick at hearing.

WHY DOES LIGHTNING STRIKE SOME THINGS AND NOT OTHERS?

We know that if lightning can choose between a lightning-rod and the rest of the roof of a house, it will go down the rod. We know that it will always choose metallic things rather than any others. And it will strike a tree rather than the ground beside the tree. In every case the principle is the same. It is that electricity will always choose the easiest path.

The usual way of saying this is that it takes the path of least resistance, and the principle is true of many things besides electricity. It is often true of ourselves. Thus, if the electric current can pass to the earth through a tree it will do so, because the tree helps its passage downward. That is why we should never stand under a tree in a thunderstorm. But, for choice, electricity will always pass through anything made of metal, for the whole group of metals are good conductors of electricity—the best there are. We do not know *why* metals conduct it so well, but we do know that that is the reason why lightning chooses them.

So a lightning-rod will protect a house if the rod runs down into the earth. If the lower part of the rod has corroded away before it reaches the earth, as sometimes happens, the electricity will be discharged into the house, and then the rod does more harm than good, for it attracts the lightning to the house.

WHERE DOES COMMON DUST COME FROM?

Dust is matter worn down into tiny pieces, like the sand in the desert. If there is much water about, it catches the dust and makes it into mud; and when the mud dries it is blown into dust again. The forces that make dust are air and water, perhaps helped a little by the power of frost and light. Of course, different kinds of things differ in the ease with which wind and rain can grind them down into dust, and so we find less dust in some places than others, even if both are equally exposed to wind and rain.

In places where men's feet or wheels of carts and carriages are traveling over and rubbing the ground, much dust is made by them. That is one reason why roads are so dusty in dry weather. Water-carts keep down the dust because water is heavy, and when a speck of dust is soaked in water, it can scarcely be blown about. In cities, also, much dust is made in the roads by horses, and it is probable that this is very bad for people's throats and eyes. But the most dangerous dust of all is the dust made by the spitting of consumptive people, and this is one of the principal ways in which consumption is spread—by consumptives themselves. Many people have worked hard for a law to prevent people from making this deadly dust, and now in many cities there are laws against spitting in trains and omnibuses and some public places.

WHY DOES OIL FLOAT ON THE SURFACE OF WATER?

It seems curious at first that one liquid should be able to float on another; but whether a thing floats on the surface of water or not depends on one or two things. First it depends upon whether it will dissolve in water or not.

If we put a piece of salt in water it disappears, because salt is soluble in water. If, however, we put a piece of light wood on water it floats, because it is not soluble, and because the weight of the wood is less than an equal bulk of water. It is much the same with oil. Oil and fat are insoluble in water, and as oil is lighter than the same bulk of water, it floats.

THE NEXT WONDER QUESTIONS ARE ON PAGE 2249.

THE ROYAL FAMILY CAPTURED BY THE MOB

With the fall of the Bastille the power of the French king was gone, for the destruction of that relic of tyranny showed the people their strength. Louis XVI was brought from Versailles to Paris by the mob, and was little better than a prisoner in his palace. At last he determined to escape with his family from Paris, but when the fugitives reached Varennes they were seen and stopped, as this picture shows.

The king and royal family, after their attempted flight, were brought back to Paris and carefully guarded in the Tuileries. Led by demagogues, the mob gradually became violent, and on June 20, 1792, the anniversary of the oath in the Tennis Court, forty thousand people marched to the Tuileries, burst into the palace, and insulted the royal family. Here the queen is standing with her children behind a table.

From the painting by Alfred Elmore, R.A., by permission of the Art Union.

Louis XVI.

Robespierre.

Danton.

Carnot.

Mirabeau.

Voltaire.

Jean Paul Marat.

St. Juste.

Charlotte Corday.

Madame Roland.

Lafayette.

Diderot.

THE FRENCH REVOLUTIONISTS

CONTINUED FROM 1998

BETWEEN the years 1789 and 1792 there were very great troubles in France, and violent changes took place. The French monarchy was turned into a republic. There was no longer a king at the head of affairs. It was said that every country ought to be ruled according to the will of the whole people who live in it, and not according to the wishes of one man or of the few who have wealth and power.

The changes which took place make up the story of what is called the French Revolution. Some of these changes in the government of the country and the life of the people have continued to the present time in France itself. Some have been adopted since that time in other countries of Europe.

We are going to learn something about the men and women who made the French Revolution, or tried to prevent it. But to be able to understand much about them we first of all must try to imagine the state of things which made people so determined to have a change. We must know why they allowed all sorts of terrible things to be done rather than stay as they were.

If in a country some people are starving through no fault of their own, while others waste money which they do not earn, there is bound to be trouble. The poor will at last become desperate, and there will be a struggle between them and the rich. It was such a state of affairs that brought about the French Revolution, with its reign of Terror that shocked the world. For hundreds of years the country people had been almost slaves to the nobles. They had to work without pay for the great landowners. They were overburdened with taxes. They had no share in making the laws. They were treated like mud under the feet of the nobles. The kings of France had become more and more extravagant and pleasure-loving. The aristocrats had become gay courtiers who thought of the peasants as mere animals. In the years before 1789 matters had become worse and worse. Thousands of people were actually starving, while the nobles frittered away the tax money in clothes and amusements. At the doors of the rich, poor fathers and mothers begged in vain for bread for their children.

There is a story which shows how little people of the upper classes knew of the sufferings of the common people. The queen of France asked someone why the people of Paris were crying out. "Because they have no bread to eat, Your Majesty," was the answer.

"Then why don't they eat cake?" demanded the queen. The peasants and the poor people of the cities were uneducated, but they felt that something was wrong in a world where poor people had no rights. So they listened with eager ears to the teachings of more educated men, like Voltaire, Diderot and Rousseau, who taught that all men are born equal and should have equal chances in life. The most famous and most powerful of these men was Jean Jacques Rousseau, who came from Switzerland. He had been brought up under hard conditions, and had led a strange, wandering, discontented sort of life. Failing in everything else at which he had tried his hand, he took to expressing his ideas in books, which made him famous.

The idea he had got hold of was that civilization was all wrong, and that people would be much happier with very little law or government. He said that people who were strong and rich had persuaded the rest to serve them by pretending to protect them. So they had got the rulership into their own hands, and used it for their own advantage.

ROUSSEAU, WHO TAUGHT THAT THE WILL OF THE PEOPLE SHOULD TRIUMPH

He thought that everybody ought to make a new agreement and settle everything by the will of the people. There should be no more kings or seigneurs or people who had privileges. Everything should be arranged in the way the people thought best. This agreement, as Rousseau wrote it, was called the Social Contract. It began with the words: "Man is born free and everywhere he is in chains." That sentence became the password of the French poor, because they understood so well what it meant.

All the seigneurs belonged to a group of great families who kept themselves aloof from ordinary folk. They are spoken of sometimes as the *noblesse* and sometimes as the aristocrats. There were a few aristocrats who were very much in favor of some of the new ideas that Diderot or Voltaire or Rousseau were talking about. The king had not nearly enough money to carry on the government, especially as there had been great expense owing to a war with England. He was advised that the only thing to be done was to summon an Assembly of the Three Estates, as the Noblesse, the Clergy and the Commons were called. With this Assembly he could consult as to whether better arrangements could be made for governing the country.

THE TWO MEN WHO MIGHT HAVE SAVED FRANCE FROM THE GREAT TERROR

At this time there were two men who became notable as leaders of the people, both of aristocratic families. The one was Mirabeau, the other was Lafayette.

It was a very unfortunate thing that these two men could not be friends. For what both of them wanted was to set up in France a government in which the voice of the people should be heard, as well as the voice of the king and his ministers. Both of them had learned many things in England or in America. Lafayette had gone to America when he was only twenty, and had served under George Washington in the war which ended in the separation of the United States from England. He had seen what Americans and Englishmen meant by freedom, and also how wise and great a man Washington was.

Mirabeau had lived for some time in England, and had seen there how it was possible for justice and law to rule everywhere without any oppression. He realized that both king and people could have a share in the government. The least that either of them wanted would have made so great a change in France that the court and most of the aristocrats and the clergy would have nothing to say to them. If King Louis had been a wiser man, he, with Lafayette and Mirabeau, might have made the French Revolution a peaceful affair.

THE GOOD KING LOUIS, WHO TRUSTED BAD COUNSELORS

Louis himself was a good man who wished to do what was right and just. He was a brave man, too. But he was not clever. And he was not like some other kings who had the wit to choose good advisers and trust them. Instead of that, he trusted people who gave him bad advice. These advisers could see nothing but harm in the changes Mirabeau and Lafayette demanded when the Three Estates were assembled in what was called the States-General (afterward the National Assembly). It seemed to them that to take away the privileges of the noblesse and clergy would be robbery. They said the proper thing for the common people was not to govern but to obey their betters.

Mirabeau understood what was needed better than any other man in France. He

THE TERROR OF THE LAST HOURS

Madame Roland, who went to execution saying: "O Liberty, what crimes are committed in thy name!" is mocked in the prison grounds.

The proud courage of Charlotte Corday in the hour of her doom.

was a man who lived a wild life privately. He was always greatly in debt, which set a good many people very much against him. And he was domineering, so that it was not easy to be friendly with him. But he was a wonderful orator. When the Assembly had come together bent on doing one thing, he could sometimes persuade it to agree to something altogether different. He would rouse people to be enthusiastic when they were timid and hesitating. In this way he had a great deal of power, though people were really afraid to trust him.

He was called the "Tribune of the People," because he was so bold in demanding what he considered the people ought to have. He thought the "privileged orders" should have their privileges taken away and should pay their proper share of the taxes.

How Mirabeau tried to bring the king and the people together

But Mirabeau saw, too, that many who had come to the Assembly had no idea as to what good government meant. The Assembly was not fit to be the real ruler. He wanted it to have power, but he knew that the only way to prevent terrible things from happening was for him to become the real ruler himself. He wanted the people to trust him, and he wanted the king to trust him. But presently it came about that the king suspected him of being on the side of the people and against the crown. The people, and those who had most influence with them, suspected him of being really on the side of the crown against the people. Yet the thing he was actually striving to do was to unite crown and people for the good of both.

Several of the changes Mirabeau wanted were made. Unfortunately, before there was any real chance of bringing the king and the people into agreement Mirabeau died. He had tried to do such an immense amount of work that he wore himself out. As soon as he fell ill, death overtook him quickly.

Lafayette was a very different kind of man. He was a popular and high-minded gentleman, who had won great praise as a soldier when he was fighting in America under Washington. After the States-General had come together, and had been turned into the National Assembly, it was found very difficult to keep order, because everyone was in a state of excitement.

Lafayette, who tried to keep order and displeased all parties

So the better class of citizens in Paris were enrolled as soldiers in what was called the National Guard. Lafayette, who was made their general, was very popular among them. Some people began to think he meant to make himself the real master by the help of his soldiers, like Julius Cæsar in Rome, or Oliver Cromwell in England. It was not very easy for the poor people to believe that so fine a gentleman as Lafayette cared much about them. The noblesse hated him because they thought he had deserted their order. The queen and court disliked him because they thought he was trying to become dictator.

When there was a great riot and Lafayette had to order his soldiers to attack the mob, the common folk liked him less than ever. He found that even his soldiers were only half inclined to obey him. He always wanted to check violence, but he could not sway men as Mirabeau could. So, when more violent men got the upper hand, Lafayette no longer commanded the National Guard. Later, when France declared war against Austria and Prussia, he was sent to command the French army, but Paris became so disturbed that he wanted to take the French troops back there. When he found that he could not do so, he would not remain in command, but left the country.

How Lafayette helped to bring back a king to France

As for what befell him afterward, he was made prisoner by the Austrians, and after some years in prison he was set free again. He helped in the restoration of the Bourbons, as the French dynasty was then called. At the end of his long life he helped in another little revolution, when the Bourbons were turned out again and their cousin Louis Philippe was made king in their place.

Now let us look at the king and queen, whose story is so tragic. Louis always meant well, and would have been quite willing to grant much more power to the people and to put an end to bad laws and customs. But the people round him were always persuading him that if he allowed one thing or another to be done, the king would never again have any power. And Louis thought a king had no right to give up his power. So he could never make up his mind to trust either Mirabeau or any

THE BIRTH OF THE FRENCH REVOLUTION

At the outset of the French Revolution the hall in which the Third Estate met was closed, to prepare it for a session which the king was to attend. The representatives of the Third Estate went to the Tennis Court and took an oath that they would never separate until the constitution of the kingdom was established.

Even after the Constituent Assembly, as the legislature was called, was recognized by the king, he and the nobles plotted against the popular cause. At last the people took up arms, and some of the troops joined them. On July 14, 1789, a day ever to be remembered in French history, they captured the Bastille, the grim fortress of Paris, and leveled it with the ground. This marks the passing of the old order of things in France.

other of the leaders of the people. On the other hand, he could never take up his stand boldly as a monarch determined that his will should be obeyed. In one way he was a brave man, for he had no fear of death. But he had not the other kind of courage which enables a man to resolve on a plan of action in which there are risks, and to carry it through in spite of all dangers and difficulties.

Soon after the death of Mirabeau the king and queen thought the best thing they could do was to take flight out of France. They thought that other kings would help them to recover their power, for the queen was the sister of the emperor of Austria.

They made preparations secretly, and in disguise fled by night from Paris in a carriage. But at a place near the frontier the king was recognized when he got out of his carriage. They were stopped and sent back to Paris, where they were kept under strict guard.

Louis accepted the new rules for governing the country which the Assembly had prepared, and so he was still king. A new Assembly was called, but the king had no able men about him now whom he could make ministers. The cleverest men he tried would not do as he wished, or serve him if he did not do as they wished. Because the Austrian emperor and the king of Prussia threatened to interfere, Louis was forced to declare war against them. Meanwhile men who were called Jacobins were stirring up feeling against the monarchy and Paris was getting very much excited.

One day there was a great procession, which found its way into the royal palace of the Tuileries. The king of France was forced to set on his head the red cap of liberty. The queen, too, had to set one on the head of the little Prince Royal, the heir to the throne. No real harm was done that time. But when ill news came from the war, and the Prussians made a proclamation that Paris would be punished if the king suffered any hurt, the people became furious.

The royal palace was attacked by a mob thirsting for blood. The valiant Swiss Guards, who defended it stoutly, were cut to pieces. Twenty-six officers and 760 men died fighting to save the royal standard. Near Lucerne, in Switzerland, is a magnificent monument to these loyal soldiers. There is the Lion monument sculptured in the face of a rocky cliff sixty feet high. Below is a still pool overhung by tall trees. The memorial shows the Swiss lion dying. And even in its death-throes it is protecting the fleurs-de-lis on the shattered shield of France. The king and queen fled with the rest of the royal family and took refuge with the Assembly. Then there came another new Assembly, which was full of Jacobins, and of Girondins, who wanted a republic. The new Assembly, or Commune, proclaimed that France was now a republic, and the king and queen were merely citizens. Even before this the Jacobins had put to death a number of supporters of the king in what were called the September massacres. The next thing was to bring the king himself to trial, as Charles Stuart had been tried in England 140 years before. Louis was tried by the Assembly itself, and condemned to death. King Louis's own cousin, Prince Philip of Orleans, was one of those who voted for his death.

Like Charles I, Louis showed a royal dignity and fortitude. He was beheaded, not with an ax, like Charles, but by an instrument called the *guillotine*.

This guillotine was an instrument of death invented by a Doctor Guillotine. Two posts were put up, one at each side of a block of wood. In the posts were grooves into which fitted the ends of a huge knife like a butcher's meat-chopper. By a string arrangement this wicked knife would be lifted to the tops of the post. The person to be executed would put his or her head on the block. The executioner would pull the string. Down would fall the knife. And the person's head would be cut from his shoulders and be dropped into a basket standing beside the block. The patriots, who had become cruel and hardened to the sight of blood, went to the executions for pleasure. Women brought their knitting and calmly counted the heads dropping into the basket as they counted stitches. The nickname "La Guillotine" was given to the death machine. The victims were brought from the prisons to the guillotine, which was in a public square, in heavy rumbling carts called tumbrils. The jolting of these death-carts over the cobblestones could be heard for a great distance, and the sound struck terror into the hearts of those who had any kindness or feeling left in them.

THE POOR ROYAL FAMILY OF FRANCE

MARIE ANTOINETTE WALKS TO HER DEATH

MARIE ANTOINETTE, LOUIS XVI AND THEIR CHILDREN IN THEIR PRISON CELL

From the painting by E. M. Ward, R.A., in Preston Art Gallery.

The poor queen and her children remained prisoners for a long time. Marie Antoinette deserves to be pitied, for, though she had not always been wise, yet when misfortune came upon her she behaved with splendid courage. It has always been counted among the wickedest deeds of the Jacobins that she, too, was sent to the guillotine by them.

She was not yet forty when she was slain. But the long, terrible months of anxiety had so changed her that she seemed almost an old woman. When she became queen of France she was a beautiful and attractive girl who had never known what it was to have her will crossed. She had been taught to take it for granted that kings and queens have a right to go their own way, so that she always encouraged the king to resist. She died her ignoble death like a queen.

One woman who was on the side of the Revolution is famous. The party that wanted a republic in France was divided in two, the Girondins and the Jacobins. Of these the Jacobins were much the fiercer. The Girondins wanted a republic like that of ancient Rome. They did not wish to destroy for the pleasure of destroying.

THE NOBLE MADAME ROLAND, WHO DIED BECAUSE SHE TRIED TO SAVE OTHERS

Madame Roland had great influence among the Girondins, and was accounted a woman both noble and wise. But after the king had been slain, the Jacobins got the upper hand altogether, and turned upon the Girondins, who wished to check bloodshed. Many of the latter were flung into prison, among them Madame Roland. Many were sent to the guillotine, though they had striven their hardest for liberty. And so it was that Madame Roland died in the same way as Marie Antoinette. "O Liberty!" she cried on her way to the guillotine, "what crimes are committed in thy name!"

No space is left for mention of all the men and women of this wild period, but three men who are commonly named together must be pictured. One of these came very near to being a great man.

This was Danton—terrible, fearless, ruthless. It was he who caused the September massacres. He thought that was the only way to make sure that there would not be a rising of the royalists just at the moment when it seemed that foreign armies might be marching on Paris. It was he who spoke these fierce words when the kings of Europe seemed to be gathering their forces to crush the French Republic: "To the kings we will fling down the head of a king as the gage of battle"—meaning that Louis should be beheaded. After that he would have joined hands with the Girondins in checking bloodshed, but they would not join with him. So he stayed with the Jacobins, attempting to curb their bloodthirstiness. Again the more cruel among them got the upper hand, and Danton, in his turn, was sent to the guillotine.

HOW A YOUNG GIRL RID FRANCE OF A BLOODTHIRSTY TYRANT

The second of the three, Marat, who called himself the "friend of the people," was foul of speech. He craved blood and was ever urging death for the aristocrats. He did not die by the guillotine, for his wickedness so stirred the heart of a girl named Charlotte Corday that she thought it was her mission to free the world from such a monster. She came to Paris, and being admitted to speak with him, drew a dagger and slew him. For which deed she, too, died under the guillotine.

The third was for a time the most powerful of them all. This was Maximilian Robespierre, a little, unhealthy-looking man, who would have been simply a respectable citizen if he had remained in private life. But he had one idea in his head which he was quite determined to carry out. This was that the will of what he called the Sovereign People must rule. The way to bring that about was to destroy everything that could possibly stand in the way—kings or aristocrats, Girondins or Jacobins, men or women, young or old. He got all the power in his own hands, till at last the guillotine was killing fifty people every day. Blood was shed like water.

THE END OF THE TERROR AND THE DEATH OF ROBESPIERRE

Then even his own supporters grew weary and disgusted. They turned upon him; and he, too, went to the guillotine. When his head fell, those who stood by shouted for joy. With his death the Reign of Terror came to an end. The ruling of the French Republic passed into the hands of a group of people called the Directory. Then Napoleon Bonaparte, who first served the Republic, overthrew it and made himself emperor.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 2189.

A winter scene at the birthplace of Robert Burns as it was in the poet's lifetime.

THE MASTER OF THE PEOPLE'S SONGS

CONTINUED FROM 2030

WE must never feel discouraged if we do not like all kinds of poetry at first; this does not mean that it is not for us. There is hardly a boy or girl who does not know and love many nursery rhymes and hymns and songs, because these sing of the everyday things of our own lives. Often we do not know the writers of these verses which have come down to us from bygone ages, preserved because they possess an appeal to our hearts.

Inspired by deep and true feeling, the songs of Robert Burns will be remembered in this way and sung for many a generation to come. He sings of everyday things, simply, sweetly and tenderly.

His writings, which have been preserved because it was believed that everything he wrote must have a value, divide themselves, on an ascending scale, into four classes.

There are the squibs and rough rhymes of a clever man, who had a vulgar side to his character and liked to show off before vulgar people with less active brains. Few men have been more mixed than Robert Burns. He had gifts that place him among men of rarest genius. At the same time he had not only weaknesses of character which, as he said, "laid him low," but he had positive commonness. A good number of his rhymes that are kept carefully alive prove it.

Then there are, next, his frolicsome, critical poems, amusing, satirical, sometimes bitter and perhaps publicly useful. Burns was a born satirist in one of his humors and a scorner of hypocrisy and humbug. He lived in a time when pretense abounded and loved to lash it. This humor, in good-natured moods, led him into lively fancies less biting. The best example is the breezy rush of Tam O'Shanter, describing a tipsy man's ride home through a witch-haunted night.

Next there was Burns in his serious mood, being a poet like other poets, and, in prose, a formal letter-writer like other letter-writers. On this level, if he had not written anything better, he would have been a respectable sort of poet, ranking with fifty others. Many poems which he published are not distinctive, and only one of them, The Cotter's Saturday Night, reveals the Burns who has won the heart of the world.

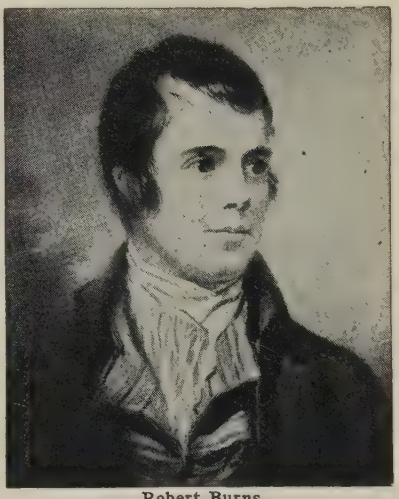
Then at last we come to his songs, and the poems which expressed his love of nature and animal life. Here he

reigns alone, if intensity of feeling be the test. No other poet has ever put love into his line as often, or with such simplicity and charm, as Robert Burns.

This quality in his songs might be put to the test of a single line.

Yestreen, when to the trembling string,
The dance gaed through the lighted ha',
To thee my fancy took its wing;
I sat, but neither heard nor saw;
Though this was fair and that was braw,
And yon the toast of a' the town,
I sighed, and said amang them a',
Ye are na' Mary Morison.

Robert Burns was brought up amid simple surroundings, a son of a struggling farmer who was intellectual rather than practical. Gifted with great force of mind and warm impulses, the boy found much in life to learn and to enjoy. Any adventure with a touch of romance he could not resist, and his active imagination shed romance around everywhere. His special reading was the old Scottish songs which had been collected and published by Robert Fergusson and Allan Ramsay.



Robert Burns.

Ramsay had altered some of these songs as Bishop Percy sometimes altered the songs he had collected in the South. Burns soon felt that he could trim and reshape songs, or write new songs to the old airs, and so he was led into tinkering songs as Shakespeare was led into tinkering plays. Soon he began to write such songs as never were before, as Shakespeare wrote such plays as never were before. In that way came the beginning of the greatest of all song-writers, and the secret of Burns's success, after he had mastered the art of composition, was the deepness of the feeling he was trying to express in song. He succeeded by the direct simplicity of his outpoured feeling where more elaborate expression would have failed. Who can fail to respond to such an ecstasy of feeling as this outburst?

She is a winsome wee thing,
She is a handsome wee thing,
She is a bonny wee thing,
This sweet wee wife o' mine.
The world's wrack we share o't,
The warstle and the care o't,
Wi' her I'll blithely bear it,
And think my lot divine.

The whole Burns family was unfortunate with farming, though the children as well as the father worked hard. Robert was the eldest son. Such spare time as he had he spent in study, in writing poetry, in love-making, and, as he grew older, in seeking society where his conversational powers would be admired. Unfortunately in this circle hard drinking was regarded as a permissible amusement. It was a dangerous life for a man who plunged into whatever he was doing with a whole-hearted impulsiveness. He was not deceived about himself. He knew his own weakness of will, and how he gave way to the whim of the moment. He wrote his own epitaph with severe unerring justice.

Is there a man whose judgment clear
Can others teach the course to steer,
Yet runs himself life's mad career
Wild as the wave?
Here pause, and, through the starting tear,
Survey this grave.
The poor inhabitant below
Was quick to learn and wise to know,
And keenly felt the friendly glow
And softer flame;
But thoughtless follies laid him low
And stained his name.
Reader, attend! Whether thy soul
Scars fancy's flights beyond the pole,
Or darkling grubs this earthly hole
In low pursuit;
Know, prudent, cautious self-control
Is wisdom's root.

Robert Burns had not that self-control at any time in his life. The sorrowful admission must be made, however great our admiration of him may be. It was largely because of that want of wise self-command that he found himself at the age of twenty-seven in such difficulties that the only way to freedom seemed to be emigration, or, in other words, flight. But he had a number of poems in hand, many of them among the best he ever wrote, as, for example, The Cotter's Saturday Night,

the Address to a Daisy uprooted by his plowshare, and the Address to a Mouse, whose nest he had destroyed. His friends urged him to publish them before he sailed for Jamaica, which was his intended destination. Besides, there was the chance that he might make a little much-needed money, for his farming had been a failure. And so, at Kilmarnock, he published his first collection of verse in 1786.

It was one of the great immediate successes of English literature. It brought him $2,500. To-day a single copy of that edition would sell for more money. Burns was at once famous throughout his native land. He was invited into the best society in Edinburgh as the literary lion of the season, the plowman-poet. He seemed in no way out of place in the fashionable literary society of the Scottish capital.

Burns and Highland Mary.
From the painting by Thomas Faed, R.A.

Of course, the idea of emigration had now vanished, but his future was not yet clear. No suitable public appointment that would make him independent and give him leisure and opportunity to develop his undoubted genius was offered to him. Soon many of his fine friends fell away, and he returned to his unsatisfactory farming, where the old familiar temptations once more surrounded him. Presently, however, Burns obtained an appointment in the Customs which allowed him to keep up farming, but the two interests clashed, and from 1791 he relied for a living on his Customs appointment, which now stationed him at the town of Dumfries. He was still writing, chiefly the songs that have made him famous, shaping them to fit old Scottish melodies. Shortly before he went to Dumfries he wrote Tam O'Shanter, which many have regarded as his best poem. Certainly it is the most vigorous. Customs inspection was about the worst work that Burns could have undertaken, for it led him where social drinking was encouraged.

The poet did not get the promotion that might have been expected, possibly because he was outspoken in his public opinions. These favored the principles of the French Revolution and the reforms in Great Britain which those in authority regarded with a vague dread. Dissatisfied and downhearted, he gave way to intemperance, lost his health, and died at the early age of thirty-seven years, on July 21, 1796.

His is a tragic life. If he had only had a little more self-control and if suitable work could have been found for him, his undoubted genius might have grown and developed. For Robert Burns had great qualities. No one has felt more truly the beauty to be found in poor and simple lives, or has expressed it with quite such genuine clearness and sincerity. No lover has written more passionately to his lady. No manlier man than Burns has ever used a pen, when he was in his inspired mood. Who has gone straighter to the mark than he in his swinging lines "A man's a man for a' that"?

Is there, for honest poverty,
That hangs his head, and a' that;
The coward slave! We pass him by,
We dare be poor for a' that!
For a' that, and a' that,
Our toil's obscure, and a' that,
The rank is but the guinea's stamp,
The man's the gowd, for a' that.

A prince can mak a belted knight,
A marquis, duke, and a' that;
But an honest man's aboon his might,
Guid faith he mauna fa' that!
For a' that, and a' that,
Their dignities, and a' that,
The pith o' sense, and pride o' worth
Are higher rank than a' that.

Then let us pray that come it may,
(As come it will for a' that),
That sense and worth o'er a' the earth
May bear the gree, and a' that.
For a' that, and a' that
It's coming yet for a' that,
That man to man, the warld o'er
Shall brothers be, for a' that.

Gowd means gold; *mauna fa'*, must not try; *bear the gree*, win the victory.

And Burns was one of the most tender-hearted of men. His sympathy was wide enough to include animals and even flowers among his circle of friends. Take his feeling toward the field mouse he had disturbed with his plow.

I'm truly sorry man's dominion
Has broken Nature's social union,
And justifies that ill opinion
Which makes thee startle
At me, thy poor, earth-born companion,
An' fellow mortal!

Or take his apology to the uprooted daisy.

Wee, modest, crimson-tippèd flower,
Thou's met me an evil hour;
For I maun crush amang the stoure
Thy slender stem;
To spare thee now is past my power,
Thou bonnie gem.

Nay, his heart is big enough to hold a kind sentiment for Satan himself with whom he has been remonstrating.

But fare you weel, auld Nickie-ben!
O wad ye take a thought an' men'!
Ye aiblins might—I dinna ken—
Still hae a stake.
I'm wae to think upon yon den
Even for your sake!

Men' means mend; *aiblins*, perhaps; *stake*, chance; *wae*, sad.

But best of all is his speech straight from the heart to the heart.

My luve is like a red, red rose,
That's newly sprung in June;
My luve is like the melody,
That's sweetly played in tune.

As fair art thou, my bonnie lass,
So deep in luve am I;
And I will luve thee still, my dear,
Till a' the seas gang dry.

Till a' the seas gang dry, my dear,
And the rocks melt wi' the sun;
I will love thee still, my dear,
While the sands o' life shall run.

And fare-thee-weel, my only luve!
And fare-thee-weel a while!
And I will come again, my luve,
Though it were ten thousand mile.

Or this from one of the world's best-known songs:

We twa hae run about the braes
And pu'd the gowans fine,
But we've wandered many a weary fit
Sin' auld lang syne.

We twa hae paidl't i' the burn
Frae mornin' sun till dine;
But seas between us braid hae roared
Sin' auld lang syne.

And here's a hand, my trusty fiere,
And gie's a hand o' thine;
And we'll tak a right guid willie-waught
For auld lang syne.

And surely ye'll be your pint-stowp,
And surely I'll be mine,
And we'll tak a cup o' kindness yet
For auld lang syne.

Fit means foot; *paidl't*, paddled; *dine*, dinnertime; *braid*, broad.

Such wealth of simple song is not to be found elsewhere, so fresh and impassioned. It brings poetry in its purest form into life, and appeals straight to the heart.

ROBERT BURNS, THE GREATEST OF THE POETS OF SCOTLAND

Criticism is out of place in the presence of the finer songs of Robert Burns. An attempt to find flaws is baffled by the quick response of the human heart everywhere to the plowman-poet's manly tenderness. Burns has said, with a simplicity and grace unequaled, what everyone who has felt the thrills of love and friendship and kinship with nature has felt but could not say. So all who know him are his grateful debtors, and all who do not know him are the poorer for their lack of his acquaintance.

And so it comes about that we feel a sense of ungraciousness in making any reference to the parts of his life that show disappointment and failure. As a poet he is by far the greatest of the Scots. And surely that is enough, without claiming for him that completeness as a man which places Walter Scott on the highest pinnacle of national fame.

THE NEXT STORY OF LITERATURE IS ON PAGE 2253.

THE HYRAX AND THE ELEPHANT

CONTINUED FROM 2020

IN the Great Hall of a celebrated natural-history museum stands a tableau which we may perhaps describe as Dignity and Impudence. It has two figures. One is an African elephant, towering 11 feet 6 inches; the other a pigmy shrew, smaller than one of the toe-nails of the figure at whose feet it is placed.

Comic to the eye, the purpose of the group is serious, for it brings into startling contrast the two extremes of an order. The shrew weighs less than half an ounce; the elephant weighs four hundred thousand times as much. Yet they are both mammals—the monarch of the land mammals and their midget.

In this chapter of our story we, too, have a contrast. It is not as great as that at the museum, but it is a notable one. For we have to associate the elephant and the hyrax. Some twenty species of hyrax exist, in Africa, Arabia and Syria; the largest is about the size of a hare, the smallest no bigger than a young rabbit.

Anyone would naturally take them to be rodents, but these little brown natives of the rocks and trees claim kin with the lordly elephant. They are grouped scientifically with the hoofed mammals, though they have no hoofs. They have blunt-clawed paws, but the bony formation of those paws and the wrist-bones overlying them are like those of the true hoofed beasts, and scientists place these little furry creatures as the nearest relatives of the elephants today. They are the coneys of the Bible.

At home in their native land it is the rock-haunting hyrax that is best known. Many travelers have told us how these animals race up bald, high rock-faces; how they delight to sprawl in the sun, chase one another about like kittens; then disappear like furred lightning into holes in a cliff at a sign of danger. Yet, with the curiosity of a child, they are bound to come back again and take a mischievous peep, or to try to find the cause of their alarm.

There is always intelligence in a little head that invents games. Play means imagination, though lowly. Dr. Chalmers Mitchell has told some delightful tales of a pet hyrax—how it scaled the walls of his room and ran along the tops of the curtain-rods; of the funny things with which it fell in love in the way of diet; and how, becoming used to the telephone, it would rush to it when the bell rang because it had come to know that it would meet its master there. Undoubtedly a hyrax makes as charming a little companion as a squirrel.

THE GREAT ELEPHANTS THAT ROAM ABOUT IN AFRICA

But we must be brief with the tribe so that we may hasten into the presence of their august kindred the elephants. All the world knows of the two great species, the Asian and the African, but latter-day exploration has revealed the existence in the Dark Continent of dwarf species.

Although it seems as if the entire elephant family arose in Africa, time and travel, habit and surroundings have brought changes, so that a child can instantly tell which is the Indian elephant and which the African. The ears alone suffice for a clue. The ears of the African animal are huge, extending back to the shoulders, while the Indian elephant's are smaller and more square. The African head is more arched outward; the trunk has a more ringed appearance, as if it were meant to fold up, like a telescope. Moreover, in the African species that sensitive outgrowth at the end of the trunk called the finger is present on the upper and lower extremities of the trunk, while the Indian elephant's trunk has but one such feature. The Indian elephant has four toes on his hind foot, while the African species has only three.

Size, too, is a distinguishing point. A full-grown elephant of the Asian species does not exceed 10 feet 6 inches nowadays, though taller exceptions have been noted in the past. But the African elephant is known to reach nearly 12 feet.

THE BIGGEST AND MOST WONDERFUL ANIMAL IN THE WORLD

The mightiest elephant known in captivity was Jumbo, an African example which our parents used to see. Eleven feet six inches in height, and weighing six and a half tons, Jumbo was brought to America, where he was unfortunately killed by a railway train. His skeleton is in the Smithsonian Institution in Washington.

Take him for all in all, the elephant is the most wonderful animal in the world, the biggest of all creatures on land, and, with the doubtful exception of the apes and monkeys, the cleverest, *in his natural wild condition.* Dogs and horses have been thousands of years domesticated, but practically every domesticated elephant is captured in a state of freedom. It inherits no experience of servitude to man. It learns after it is grown up, and this most other animals cannot do.

The brain of the elephant is a splendid instrument. The old monsters grew bodies vast as trees, with tiny, contemptible heads. The elephant tribe grew mind and muscle at the same time. It has wandered far and been for thousands of years in free contact with man. Not until firearms arrived was there the least danger to the continued existence of his family.

It may be argued that if he has so acute a brain he ought never to have submitted to servitude. That does not follow. There is such a gap between human and animal intelligence that the comparison cannot be made fairly. Man is something apart, with soul and spirit which gave him lordship over all intelligent animals. And the better the animal brain, the easier is it to educate the animal to submission to human methods.

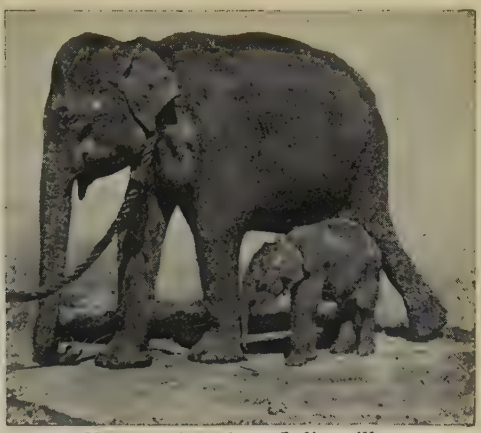
THE ELEPHANT CAN DO MANY WONDERFUL THINGS

Now, what have the elephants made of life? They have a great span of years—a century and a half, perhaps as much as two centuries—of which the first twenty or twenty-five years are given to growing up. They have dim sight, but they have sensitive hearing and a sense of smell as keen as a bloodhound's. They are superb swimmers, for all their weight. They climb mountains with ponderous agility; they descend the steepest slopes with skill. They do not slither straight down, but march with deliberation diagonally across a dangerous hill-face, so reducing the danger of slipping. They move in herds with the precision and order of Boy Scouts on trail.

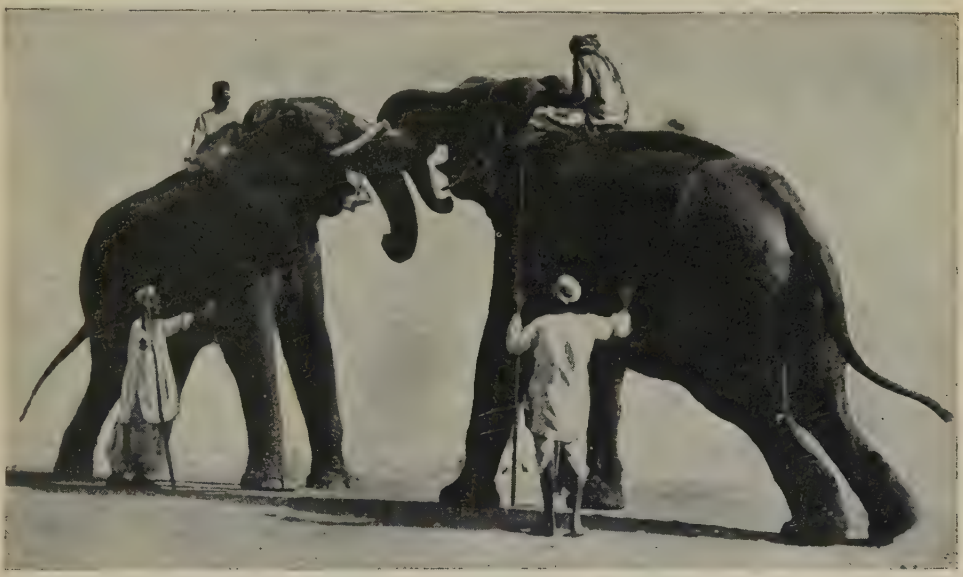
It is a thrilling experience to watch them when they approach water at night, suspicious that a man is hiding in the neighborhood. The herd halts at a safe distance while a messenger is sent forth to explore. He creeps forward silently, like a six-ton ghost, stands rigid and attentive, his trunk swaying this way and that in search of air-borne clues. If danger seems absent or remote, the watchman of the herd trumpets a low signal to those in hiding. The signal is answered and confirmed. Then out come the host, cautiously, silently, down to the water. That once reached, fear vanishes; they rush in and drink, and sport with the delight of boys taking their first summer plunge. Equally impressive is the code of trumpet-calls by which scattered

PICTURES OF THE ELEPHANT FAMILY

The African elephant.



Mother and son in an Indian village.



Two Indian elephants enjoy a wrestling match.

After the day's work—a bath in the river Jumna in India.

herds assemble, hailing one another from afar, and meeting with unerring accuracy at one point.

THE REMARKABLE THINGS THAT AN ELEPHANT CAN DO

An untaught elephant can do more with rough tools, so to speak, than any other animal. The story is told of a little one trained by its mahout to draw water by means of a bucket from a well. A larger elephant, approaching the well at the same time, stole the little fellow's bucket. Rage and jealousy possessed the victim, but he kept his head. Drawing back a stride or two while the other was getting water, he suddenly lunged at him from the rear and toppled him head foremost into the well.

The only thing possible by way of rescue was for men to throw timbers down the well and leave the rest to the prisoner. The course was quite satisfactory. The elephant methodically arranged the timber round about and beneath it, constructed a platform and so raised himself to safety. But, it may be objected, that was the instructed art of a domesticated elephant. Let us see what an uninstructed one can do in the wilds.

The scene was an exciting one in a forest in Ceylon. A party was chased by a huge elephant, one of the solitary sort we call "rogues." Just in time all the men scrambled into a tree. The elephant promptly tried to uproot the tree with his trunk. He failed, and moved round to the other side, where he renewed his efforts, but again without success.

It happened that there was a quantity of cut timber stored near. The elephant went to this and removed it, a piece at a time, to the root of the tree. When all had been placed in position to form a platform, he mounted it, stood on his hind legs and endeavored to reach the hiding men with his trunk. It would have been interesting to see to what length his ingenuity would have gone, but repeated shots from the prisoners put an end to the experiment.

THE WONDERFUL STILLNESS OF THE ELEPHANT IN THE JUNGLE

We have mentioned rogue elephants. They are mysterious animals. In general, elephants are very affectionate and social, but occasionally something happens to bring one into disfavor. Then he is driven out of elephant society. They will not have him near them, but drive him off. The outcast is forthwith a rogue. He becomes as vindictive as a human outlaw against whom all hands are turned. He will trample down plantations, will overturn wooden habitations, and lurk in ambush and destroy human life as we destroy noxious insects. Things of this sort happen regularly in India; while in Africa rogue elephants on the line of the railway in Rhodesia, a few years ago, became so terrible in their methods that the Government had to give orders for their destruction.

The stealth and silence of such animals pass belief. Hunters have repeatedly told us how astonished they have been to come face to face with an elephant in a jungle, quite unaware that the giant was moving near them. And those which frequented the Rhodesian railway would advance from the rear, absolutely unheard, and deeply imbed their tusks in the back of an unfortunate man before he had a chance of knowing that an elephant was within ten miles of him.

THE CUSHION ON WHICH THE ELEPHANT TRAMPS THE EARTH

This stealthiness is rendered possible, of course, by the great padded feet of the beast. Naturally they are the largest of all feet. A tracker can guess the size of an elephant from the impression it leaves. It is the rule that the circumference of one of its forefeet is half its height at the shoulder. That is to say, the distance round a forefoot of an African elephant ten feet high would be five feet. The foot is a huge cushion, thick hide on the outside and an intricate mass of tissue and fat within.

Upon these strange feet the limbs rise like pillars. We do not need to be reminded that the hind legs of the elephants bend with the joint forward, like our legs, not backward. Thus, when the elephant kneels, it turns its hind feet away from him, not under the body as a horse does. The reason is that it must have this method of support to carry the enormous weight.

WHAT THE ELEPHANT LIKES AND WHAT IT DOES NOT LIKE

The skin of the elephant is naturally very thick and tough; the hide alone may weigh over a ton. Yet it is sensitive, and the elephant takes as much care of its covering as we take of our own bodies, though in a different way. The big

THE ELEPHANT AT WORK AND PLAY

A herd of elephants in Siam comes down to drink.

The elephant moving timber in Burma.

Cousins from Africa and India.

The elephant's play-time in Ceylon.

A meal of bamboo after a bath.

animal cannot stand the intense heat of the noonday sun in the open, but seeks shade, like other tropical animals. It loves to spray itself, by means of its trunk, with dust, to fan itself with a branch of a tree. Best of all, it likes to have a bath, followed either by an anointing of mud or a dust shower, as a defense against flies and other parasites.

In captivity these aids to comfort are not always to be had, so man comes to the rescue. A captive elephant is scrubbed now and then, and his hide is oiled. A friendly elephant enjoys this treatment, but the most docile dislikes having the end of the trunk touched if it is at all out of order.

One which was brought from India to London in 1920 proved as mischievous as a monkey on board the ship. Among other things she thrust her trunk half a yard deep into a tub of white paint. The upper part of the trunk she allowed her keeper to clean with an oiled rag, but she would not permit him to handle the tip. Still she knew that for her own comfort it must be cleansed, and she seemed perfectly to understand the purpose of her attendant when he thickly painted her front legs with oil. She at once began rubbing the offended trunk-tip against the oily legs, and herself removed the unpleasant substance.

THE ELEPHANT THAT CAN PICK UP A COIN WITH ITS TRUNK

The trunk is everything to the elephant. With it one of these animals can do pretty much what we do with our hands. It will pick up a man and place him on its back; then pick up and give him a coin which has fallen from his pocket. The trunk serves to smash a tiger which attacks, though tusks and trampling feet are used for the same purpose. It acts, too, as a flail to thrash another elephant or to knock down an offending man. It pulls up a tree; it sucks up water or grain, and deposits both down the great yawning throat. It is a pump with which to squirt dirty water over a man who may have offended years before; and it is the means by which a mother will make her little one obey.

No better example of this comes to mind than that of a mother and young one in India, when the junior sustained so bad and painful a wound that it could not bear to have it dressed. The surgeon was in despair at the thought of losing a valuable little animal, but somehow he managed to make the mother understand his purpose. She seized the young one with her trunk and, with the help of the body and front legs, forced it to the ground and held it there while its wound was opened and purified. She did the same thing the next day and the following days until the hurt was cured.

THE GREAT CREATURE THAT NEVER FORGETS AND ALWAYS OBEYS

Elephants are very much like us in some of their attributes. They are jealous, passionate, sometimes surly, but they love with great fidelity. A man who has trained an elephant in its youth has been known to win the same animal to instant obedience years after it has escaped and lived in forest freedom. Such an elephant never forgets, and it obeys promptly the word of command.

An elephant which struck work in 1920, and remained defiant for two years, did so because in the first instance she was frightened at something which happened on her round in the grounds. Then, apparently, she enjoyed the state of rebellion, and nothing could be done with her. She was not vicious, but calmly determined to resist discipline. In the end a native mahout was sent for from India. He talked to her as she was talked to in her youthful training, and recalled her to a sense of duty. He reconstructed in her mind the scheme of obedience to which she had first bowed, and in 1923 she was back at work again, under control, as amiable as a great kitten.

It is a striking tribute to elephant affection and care that Indian mothers intrust their sprawling babies to these giants. A tethered elephant is the nursemaid in many a mahout's family. But failure happens even in India, where the understanding between elephants and men passes Western understanding.

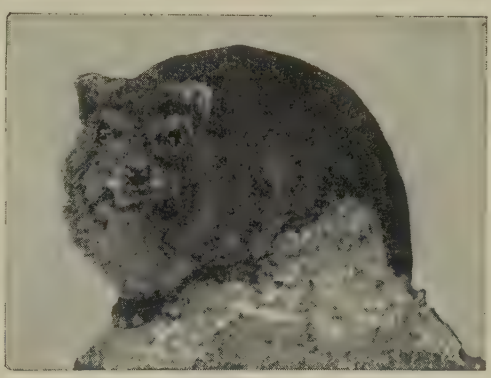
In one case, after a great hunt, a rogue was caught with the rest. He bit off the tail of one of his captors. The injured elephant's logic was at fault for a moment, for it somehow connected its master with its suffering. He was kneeling preparing its food. The elephant broke its chain, picked him up, and dashed him down badly hurt. Then, as if sorry or fearful at what it had done, it strewed foliage over him and bolted for the forest.

That is not the only example of tail-biting; others come to memory, but do

such things happen in the wilds? Apparently not. There the contest is waged upon more ferocious lines. One elephant has been seen to sink its frightful teeth in the head of another; while charges that overthrow, and thrusts with the tusks that penetrate deep into the flesh, are the order when battle is seriously joined.

These affrays do not often happen in captivity, and mishaps of any kind are rare. When we hear of them, something exceptional has occurred. Ordinarily, elephant-work goes on placidly.

What the mahout has to guard against is fright for his beasts. One in a zoo dropped dead of terror during a thunderstorm; another caused a stampede because a mouse frightened it. Elephants may instinctively recognize danger from rats. Four young elephants were killed in one night at Hamburg, not long ago, dying from terror as much as from loss of blood, through the soles of their feet being gnawed during the darkness by rats. That confirms common knowledge that elephants are so sensitive that they do not endure unusual hardship as some other animals do.



The Hyrax.

A baby elephant.

A fierce animal, when mastered after long resistance and put to work, may lie down and die; another will pine and die for loss of friendship. This happened when the elephant Jingo was sent across the Atlantic in 1903. It never ate a meal after quitting its London keeper, and it died at sea, "heartbroken," said those in attendance on it.

Sudden noises are terrifying to elephants. That is why they are gradually losing their places in the superb state processions in India, and why oxen have to relieve them of the big guns when the firing line is neared. A shot might stampede the big creatures. But to see an elephant move a bogged gun when oxen have given up is a joy. Captain Campbell, who has had many teams of bullocks and elephants under his charge in India, tells us how it is managed.

The elephant marches up with an important air to a gun which has come to grief, and deliberately inspects the state of affairs. He tries a wheel here and a wheel there with his trunk to see how fast stuck they are. He ponders again, with a little twinkle, as if to say, "All right, I can start her, I think"; gives a little push here and a little push there, and, finally, with a tremendous blast from his trunk to tell the bullocks to start pulling, he applies his padded forehead to the muzzle of the gun, and out it comes.

But, notice, it is not the trunk that does the work. The weight-carrying of which we hear, the building-up of walls of masonry, the carrying of tree trunks—that is done not with the trunk, but with the tusks and head, sometimes helped by the trunk, but never with that delicate organ alone. As to the tusks, they serve for battle, defense and for fighting.

THE MARCH OF THIRTY-SEVEN ELEPHANTS ACROSS THE ALPS

As we have seen, African Jumbo was like a titanic lamb at times. And who does not remember the story of the elephants of Carthage? When Hannibal fought Rome for the mastery of the world, thirty-seven of his elephants made the marvelous march across the snowy ice-bound Alps. We know that his elephants were African because one of the few authentic mementos of Carthage re-

maining to us is a gold coin bearing an African elephant perfectly outlined upon it. It is possible, however, that Hannibal's elephants were of a smaller species, now extinct, and not the African elephant of to-day. Some students of elephants think that it may be possible to domesticate the African elephant. If so, he may be saved. Otherwise he will disappear before the hunters.

The various pigmies of equatorial Africa

In Africa, near the Equator and west of the great lakes in the central portion is a region in which three interesting pigmies have been found—pigmy men, pigmy hippopotamuses and, finally, pigmy elephants. Strange to say, though Europeans have been exploring Africa for hundreds of years, only recently have these pigmies been recognized as separate species. Apparently the explorers, if they saw them at all, thought that they were babies, and not full grown.

The great German animal-collector Carl Hagenbeck sent out the expeditions which captured the first of these pigmy beasts alive, and specimens of both were sold to the New York Zoölogical Gardens. The first specimen of the pigmy elephant died after several years. The specimen now on exhibition there was captured by Miss Alyse Cunningham, the trainer of the famous John Gorilla, and her brother, Captain Cunningham.

Some of the peculiarities of the pigmy elephant

"Tiny" is very affectionate and exceedingly playful. She loves the world and all connected with it. When she arrived she was supposed to be about two and a half years old, and was thirty-six inches high, about the size of an Indian elephant at birth. This species has small round ears instead of the huge triangular ears of the ordinary African elephant. It also has five toes on the front foot and four on the hind foot—one more than the larger African species.

Several other dwarf elephants have been discovered in modern days. In the adult condition they seem to grow only to seven feet in the largest examples. Some are still smaller, but the condition of their teeth and their hard-worn little tusks show that they are fully mature. Specimens suggest that there are two or three dwarf species, and we hear from a French naturalist of a pigmy water-elephant. Even these comparative midgets are stalwart fellows compared with some that have existed. Malta once had elephants little bigger than sheep.

Mammoths that sank out of sight and were found later

The family has been a great one of many forms. We all know how often relics come to light of the mastodon and the mammoth. The mastodons were many in species, spread over vast ages of time. There were several species in America, and some think that the Indians put an end to them. The mammoth resembled the Indian elephant, but was very hairy. It roamed over Europe, Northern Asia, and North America from Alaska to New England.

Finds of entire bodies of mammoths have been made from time to time in Siberia and parts of Russia. They sank bogged in water-logged soil, and were frozen in. The land remained frozen for a long time. When it thawed it revealed a ponderous animal, perfect, the flesh untainted, the hair all in place, the last meal of fir cones undigested in the stomach. So fresh is the flesh that a naturalist once served mammoth steak to his guests at a dinner-party. They thought, until let into the secret, that it was meat from some animal newly killed.

Mastodon; mammoth; the straight-tusked elephant of the Pleistocene Period; the Southern elephant, thirteen feet high; the flat-headed elephant; the stegodont elephant; four-tusked elephants; elephants with only two tusks curving down from the end of the lower jaw—there has been a mighty family of them all.

Something like a giant oak walking about a zoo

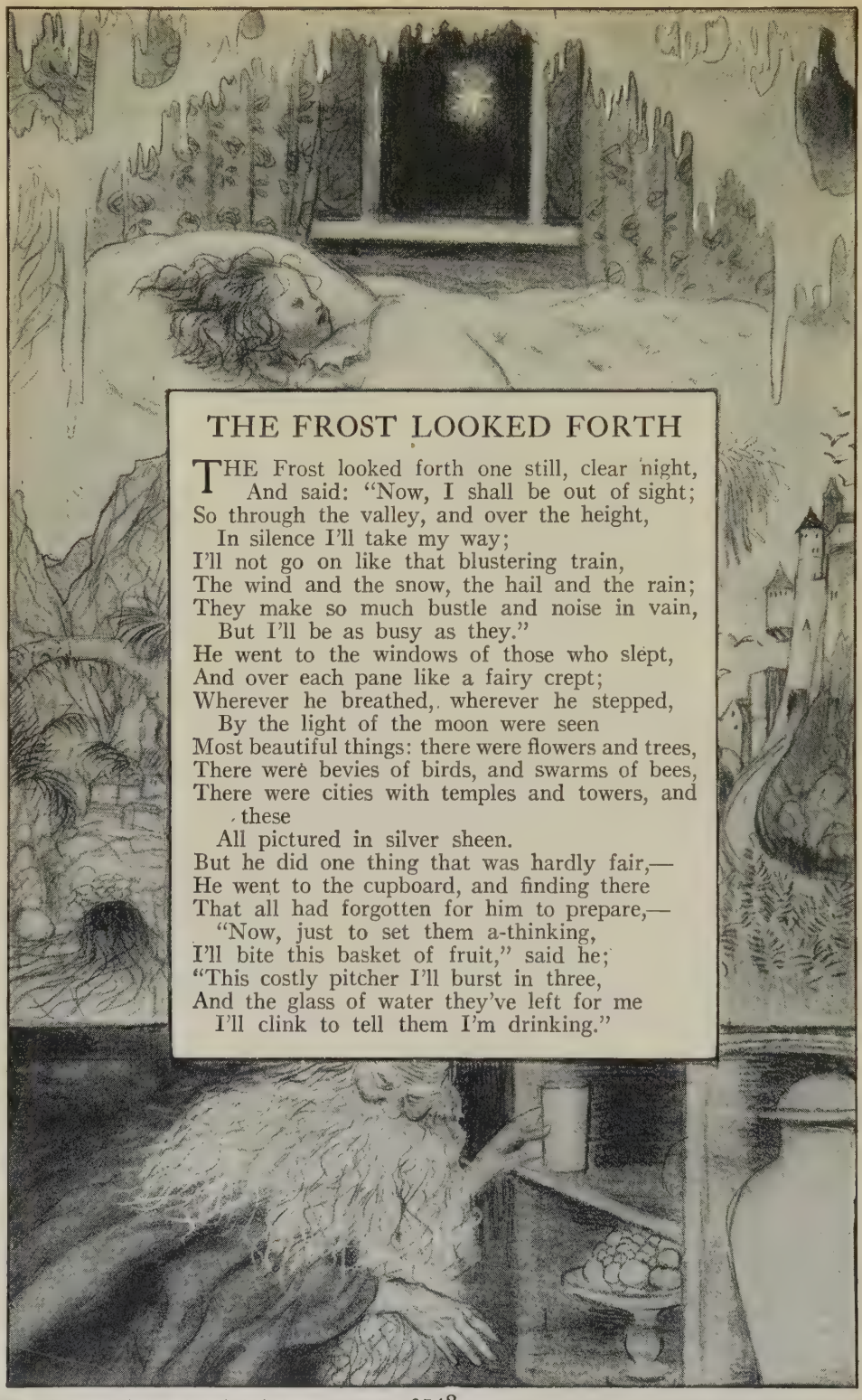
In India the elephants are the greatest prime movers man has—clever, kind, contriving; in Africa they are the supreme marvels of a natural menagerie continent-wide. Their existence in the world with us lends romance and vision even to a townsman's humdrum existence. We can go to any zoo and see an elephant, feed it, stroke it.

An elephant is good to see. It is so gigantic, so archaic, so unbelievable, that it makes us realize dimly what the world must have been like when beasts such as this were common. Many, as we know, were larger and more fearfully formed than the elephant.

THE NEXT STORY OF ANIMAL LIFE IS ON PAGE 2213.

Copy of a painting of the Woolly Mammoth, by Charles R. Knight, in the American Museum of Natural History. The Woolly Mammoth has been found in various fossil beds of North America, but the best specimens have come from Indiana and Alaska. This animal reached a height at the shoulder of a little more than nine feet, while the living African elephant is more than eleven feet at the shoulder.

The group of African Elephants in the American Museum of Natural History, mounted by Carl E. Akeley. This group is intended for the central group of the projected African Hall, which will form part of a section of the Museum to be erected as a memorial to Theodore Roosevelt. The female was secured especially for this group by Theodore Roosevelt during his African Expedition of 1909, and was shot while charging; the little one was shot by Kermit Roosevelt.



THE FROST LOOKED FORTH

THE Frost looked forth one still, clear night,
And said: "Now, I shall be out of sight;
So through the valley, and over the height,
In silence I'll take my way;
I'll not go on like that blustering train,
The wind and the snow, the hail and the rain;
They make so much bustle and noise in vain,
But I'll be as busy as they."
He went to the windows of those who slept,
And over each pane like a fairy crept;
Wherever he breathed, wherever he stepped,
By the light of the moon were seen
Most beautiful things: there were flowers and trees,
There were bevies of birds, and swarms of bees,
There were cities with temples and towers, and these
All pictured in silver sheen.
But he did one thing that was hardly fair,—
He went to the cupboard, and finding there
That all had forgotten for him to prepare,—
"Now, just to set them a-thinking,
I'll bite this basket of fruit," said he;
"This costly pitcher I'll burst in three,
And the glass of water they've left for me
I'll clink to tell them I'm drinking."

THE GRAY SWAN

HERE is a whole story told by Alice Cary in nine verses. A little boy who had run away to sea in the Gray Swan remained, in the thought of his loving mother, a little boy through all the years, until he came back so old that his mother did not recognize him at first. The poem is an illustration of the undying and forgiving mother-love which sees no wrong in her child.

"O SAILOR, tell me, tell me true,
Is my little lad—my Elihu—
A-sailing in your ship?"
The sailor's eyes were dimmed with dew.
"Your little lad? Your Elihu?"
He said with trembling lip;
"What little lad—what ship?"

CONTINUED FROM 2040

"What little lad?—as if there could be
Another such a one as he!
What little lad, do you say?
Why, Elihu, that took to the sea
The moment I put him off my knee.
It was just the other day
The Gray Swan sailed away."

"The other day?" The sailor's eyes
Stood wide open with surprise.
"The other day?—the Swan?"
His heart began in his throat to rise.
"Ay, ay, sir; here in the cupboard lies
The jacket he had on."
"And so your lad is gone,

"Gone with the Swan. And did she stand
With her anchor clutching hold of the sand
For a month, and never stir?"
"Why, to be sure! I've seen from the land,
Like a lover kissing his lady's hand,
The wild sea kissing her—
A sight to remember, sir."

"But, my good mother, do you know
All this was twenty years ago?
I stood on the Gray Swan's deck,
And to that lad I saw you throw—
Taking it off, as it might be so—
The kerchief from your neck."
"Ay, and he'll bring it back."

"And did the little lawless lad,
That has made you sick and made you sad,
Sail with the Gray Swan's crew?"
"Lawless! The man is going mad;
The best boy ever mother had;
Be sure, he sailed with the crew—
What would you have him do?"

"And he has never written line,
Nor sent you word, nor made you sign,
To say he was alive?"
"Hold, if 'twas wrong, the wrong is mine;
Besides, he may be in the brine;
And could he write from the grave?
Tut, man, what would you have?"

"Gone twenty years! A long, long cruise;
'Twas wicked thus your love to abuse;
But if the lad still live,
And come back home, think you you can
Forgive him?" "Miserable man!
You're as mad as the sea; you rave!
What have I to forgive?"

The sailor twitched his shirt so blue,
And from within his bosom drew
The kerchief. She was wild:
"My God!—my Father!—is it true?
My little lad—my Elihu!
And is it?—is it?—is it you?
My blessed boy—my child—
My dead—my living child!"

YOU NEVER CAN TELL*

Ella Wheeler Wilcox had always some good advice for us in her poems, and these verses are really a little sermon. If all sermons were as brightly written and as short as this there would surely be no lack of readers.

YOU never can tell when you send a word,
Like an arrow shot from a bow
By an archer blind, be it cruel or kind,
Just where it may chance to go.
It may pierce the breast of your dearest friend,
Tipped with its poison or balm;
To a stranger's heart in life's great mart
It may carry its pain or its calm.

You never can tell when you do an act
Just what the result will be;
But with every deed you are sowing a seed,
Though the harvest you may not see.
Each kindly act is an acorn dropped
In God's productive soil;
You may not know, but the tree shall grow,
With shelter for those who toil.

You never can tell what your thoughts will do
In bringing you hate or love;
For thoughts are things, and their airy wings
Are swifter than carrier dove.
They follow the law of the universe:
Each thing must create its kind;
And they speed o'er the track to bring you back
Whatever went out of your mind.

ETERNAL RULER OF THE CEASELESS ROUND

This noble hymn was written by an American Unitarian minister, John White Chadwick, who was born in 1840 and died in 1904. He published several books of verse, and was a very just critic.

ETERNAL Ruler of the ceaseless round
Of circling planets, singing on their way,
Guide of the nations from the night profound
Into the glory of the perfect day,
Rule in our hearts, that we may ever be
Guided and strengthened and upheld by Thee.

We would be one in hatred of all wrong,
One in our love of all things sweet and fair;
One with the joy that breaketh into song,
One with the grief that trembles into prayer;
One in the power that makes Thy children free
To follow truth, and thus to follow Thee.

O clothe us with Thy heavenly armour, Lord,
Thy trusty shield, Thy sword of love divine;
Our inspiration be Thy constant word;
We ask no victories that are not Thine.
Give or withhold, let pain or pleasure be,
Enough to know that we are serving Thee.

* By courtesy of W. B. Conkey Company, Hammond, Indiana.

LAND OF HOPE AND GLORY

Arthur Christopher Benson, the author of these lines, is the gifted son of an Archbishop of Canterbury, and one of three brothers who have won distinction. Mr. Benson has published several interesting volumes of essays and poems. The poem is set to music by Sir Edward Elgar.

DEAR Land of Hope, thy hope is crowned;
God make thee mightier yet!
On Sov'ran brows, beloved, renowned,
Once more thy crown is set.
Thine equal laws, by freedom gained,
Have ruled thee well and long;
By freedom gained, by truth maintained,
Thine Empire shall be strong.

Thy fame is ancient as the days,
As ocean large and wide;
A pride that dares, and heeds not praise,
A stern and silent pride;
Not that false joy that dreams content
With what our sires have won;
The blood a hero sire hath spent
Still nerves a hero son.

Land of Hope and Glory, mother of the free,
How shall we extol thee who are born of thee?
Wider still and wider shall thy bounds be set;
God, who made thee mighty, make thee mightier yet!

THE HUMMING TOP†

Here is another poem by the favorite children's poet, Eugene Field. We never tire of his delightful verses.

THE top it hummeth a sweet, sweet song
To my dear little boy at play;
Merrily singeth all day long,
As it spinneth and spinneth away.
And my dear little boy
He laugheth with joy
When he hears the monotone
Of that busy thing
That loveth to sing
The song that is all its own.

Hold fast the string and wind it tight
That the song be loud and clear;
Now hurl the top with all your might
Upon the banquette here;
And straight from the string
The joyous thing
Boundeth and spinneth along;
And it whirrs and it chirrs
And it birrs and it purrs
Ever its pretty song.

Will ever my dear little boy grow old,
As some have grown before?
Will ever his heart feel faint and cold
When he heareth the songs of yore?
Will ever this toy
Of my dear little boy,
When the years have worn away,
Sing sad and low
Of the long ago,
As it singeth to me to-day?

† From Poems of Eugene Field, copyright, 1910, by Julia S. Field; published by Charles Scribner's Sons. By permission of the publishers.

CHER AMI, D.S.C.

In the World War, during the desperate fighting in the Argonne Forest, an American battalion was cut off in the heart of the forest. Cher Ami, the American carrier pigeon, was the means of saving the "Lost Battalion." For this and another exploit, it was brought to Washington, D. C., where by Government orders it was accorded the finest care and given the Silver Cross for distinguished service (D.S.C.) by General Pershing. This poem by Harry Webb Farrington must touch the heart of everyone who reads it. The whole very interesting story is told on page 2319.

CHER AMI, how do you do!
Listen, let me talk with you;
I'll not hurt you, don't you see?
Come a little close to me.

Little scrawny blue and white
Messenger for men who fight,
Tell me of the deep, red scar,
There, just where no feathers are.

What about your poor left leg?
Tell me, Cher Ami, I beg.
Boys and girls are at a loss
How you won that Silver Cross.

"The finest fun that came to me,
Was when I went with Whittlesey;
We marched so fast and far ahead,
'We all are lost,' the keeper said!

" 'Mon Cher Ami (that's my dear friend),
You are the one we'll have to send;
The whole battalion now is lost,
And you must win at any cost.'

"So with the message tied on tight,
I flew up straight with all my might;
Before I got up high enough,
Those watchful guns began to puff.

"Machine-gun bullets came like rain,
You'd think I was an aeroplane;
And when I started to the rear,
My! the shot was coming near!

"But on I flew, straight as a bee,
The wind could not catch up with me;
Until I dropped out of the air,
Into our own men's camp, so there!"

But Cher Ami, upon my word,
You modest, modest little bird;
Now don't you know that you forgot?
Tell how your breast and leg were shot.

"Oh, yes, the day we crossed the Meuse,
I flew to Rampont with the news;
Again the bullets came like hail,
I thought that surely I should fail.

"The bullets buzzed by like a bee,
So close, they almost frightened me;
One struck the feathers of this sail,
Another went right through my tail.

"But when I got back to the rear,
I found they hit me, here and here;
But that is nothing, never mind;
Old Poilu, there, is nearly blind.

"I only care for what they said,
For when they saw the way I bled,
And found in front a swollen lump,
The message hanging to this stump;

"The French, and Mine, said, 'très bien,'
Or 'very good'—American,
'Cher Ami, you brought good news,
Our Army's gone across the Meuse!

" 'You surely had a lucky call!'
And so I'm glad, I guess that's all;
I'll sit, so pardon me, I beg;
It's hard a-standing on one leg."

BREAK! BREAK! BREAK!

Few of the shorter poems of Lord Tennyson are more quoted than these beautiful lines in which he suggests so perfectly that undertone of melancholy which seems to tune our thoughts when we stand by the seashore on a gray day and listen to the solemn music of the waves.

BREAK, break, break,
On thy cold gray stones, O Sea!
And I would that my tongue could utter
The thoughts that arise in me.

O, well for the fisherman's boy,
That he shouts with his sister at play!
O, well for the sailor lad,
That he sings in his boat on the bay!

And the stately ships go on
To their haven under the hill;
But O, for the touch of a vanished hand,
And the sound of a voice that is still!

Break, break, break,
At the foot of thy crags, O Sea!
But the tender grace of a day that is dead
Will never come back to me.

SALLY IN OUR ALLEY

Few songs are better known than this, supposed to be sung by the apprentice who loves his pretty Sally so dearly, although she lives in a humble alley. An Englishman, Henry Carey, is the author of this song.

OF all the girls that are so smart
There's none like pretty Sally;
She is the darling of my heart,
And lives in our alley.
There is no lady in the land
That's half so sweet as Sally;
She is the darling of my heart,
And lives in our alley.

Of all the days within the week
I dearly love but one day—
And that's the day that comes between
A Saturday and Monday;
Oh! then I'm dress'd in all my best
To walk abroad with Sally;
She is the darling of my heart,
And lives in our alley.

When Christmas comes about again,
O, then I shall have money;
I'll hoard it up, and box it all,
I'll give it to my honey:
I would it were ten thousand pounds,
I'd give it all to Sally;
She is the darling of my heart,
And she lives in our alley.

A BOY'S THANKSGIVING

The very least that we all owe in this world is gratitude for our lives. Nowhere has that gratitude been more truly and simply expressed than in this poem by a boy, Richard Molesworth Dennis, who was killed in the World War.

GOD'S gifts so many a pleasure bring
That I will make a thanksgiving.

For eyes whereby I clearly see
The many lovely things there be;

For lungs to breathe the morning air,
For nose to smell its fragrance rare;

For tongue to taste the fruits that grow,
For birds that sing and flowers that blow;

For limbs to climb, and swim, and run,
And skin to feel the cheerful sun;

For sun and moon and stars in heaven,
Whose gracious light is freely given;

The river where the green weed floats,
And where I sail my little boats;

The sea, where I can bathe and play,
The sands, where I can race all day;

The pigeons wheeling in the sun,
Who fly more quick than I can run;

The winds that sing as they rush by,
The clouds that race across the sky;

The pony that I sometimes ride,
The curly dog that runs beside;

The shelter of the shady woods,
Where I may spend my lonely moods;

The gabled house that is my home,
The garden where I love to roam.

And bless my parents every day,
Though they be very far away.

Take Thou my thanks, O God above,
For all these tokens of Thy love.

And when I am a man do Thou
Make me as grateful then as now.

THE FAIRY LIFE

From Shakespeare's play A Midsummer Night's Dream.

OVER hill, over dale,
Through bush, through brier,
Over park, over pale,
Through flood, through fire,
I do wander everywhere,
Swifter than the moon's sphere;
And I serve the fairy queen,
To dew her orbs upon the green;
The cowslips tall her pensioners be;
In their gold coat spots you see;
Those be rubies, fairy favours,
In those freckles live their savours;
I must go seek some dewdrops here,
And hang a pearl in every cowslip's ear.

TO A BUTTERFLY

The great poet William Wordsworth, in these charming verses to a butterfly, gives us the proper point of view from which to regard one of the loveliest of all created things. We can hardly read this poem without entering into the loving spirit of the poet. And who then would have the desire to chase these living flowers?

I'VE watched you now a full half-hour,
Self-poised upon that yellow flower;
And, little Butterfly! indeed
I know not if you sleep or feed.
How motionless! not frozen seas
More motionless! and then
What joy awaits you, when the breeze
Has found you out among the trees,
And calls you forth again!

This plot of orchard-ground is ours;
My trees they are, my sister's flowers.
Here rest your wings when they are weary,
Here lodge as in a sanctuary!
Come often to us, fear no wrong;
Sit near us on the bough!
We'll talk of sunshine and of song,
And summer days when we were young;
Sweet childish days that were as long
As twenty days are now.

A WINTER SONG

As William Shakespeare, the greatest of all poets, wrote chiefly for the stage, his poetry taking the form of great dramatic pieces to be spoken and acted on the stage, we find in his works few short complete poems. This one is taken from his play Love's Labour's Lost.

WHEN icicles hang by the wall,
And Dick the shepherd blows his nail,
And Tom bears logs into the hall,
And milk comes frozen home in pail,
When blood is nipp'd, and ways be foul,
Then nightly sings the staring owl,
To-who;
Tu-wit, to-who, a merry note,
While greasy Joan doth keel the pot.

When all aloud the wind doth blow,
And coughing drowns the parson's saw,
And birds sit brooding in the snow,
And Marian's nose looks red and raw,
When roasted crabs hiss in the bowl,
Then nightly sings the staring owl,
To-who;
Tu-wit, to-who, a merry note,
While greasy Joan doth keel (cool) the pot.

UNDER THE GREENWOOD TREE

From Shakespeare's play As You Like It.

UNDER the greenwood tree,
Who loves to lie with me;
And tune his merry note
Unto the sweet bird's throat.
Come hither, come hither, come hither;
Here shall he see
No enemy,
But winter and rough weather.

Who doth ambition shun,
And loves to live i' the sun;
Seeking the food he eats,
And pleased with what he gets.
Come hither, come hither, come hither;
Here shall he see
No enemy,
But winter and rough weather.

HUNTING SONG

The author of this hunting song is unknown, but he was a true poet and a lover of the chase, for his lively verses breathe the spirit of England's time-honored sport. The song is of the time of Henry VIII.

THE hunt is up, the hunt is up,
And it is well nigh day;
And Harry our king has gone hunting
To bring his deer to bay.

The east is bright with morning light,
And darkness it is fled;
And the merry horn wakes up the morn
To leave his idle bed.

Behold the skies with golden dyes
Are glowing all around;
The grass is green, and so are the treen
All laughing at the sound.

The horses snort to be at sport,
The dogs are running free,
The woods rejoice at the merry noise
Of hey tantara tee ree!

The sun is glad to see us clad
All in our lusty green,
And smiles in the sky as he riseth high
To see and to be seen.

Awake all men I say again,
Be merry as you may;
For Harry our king has gone hunting
To bring his deer to bay.

THE OWL

If we look at page 2152 we shall find a song from Shakespeare beginning "When icicles hang by the wall," and it will be seen that Lord Tennyson in the following lines on the owl has to some extent modeled his verse on Shakespeare's.

WHEN cats run home and light is come,
And dew is cold upon the ground,
And the far-off stream is dumb,
And the whirring sail goes round,
And the whirring sail goes round;
Alone, and warming his five wits,
The white owl in the belfry sits.

When merry milkmaids click the latch,
And rarely smells the new-mown hay,
And the cock hath sung beneath the thatch
Twice or thrice his roundelay,
Twice or thrice his roundelay;
Alone, and warming his five wits,
The white owl in the belfry sits.

A FAIRY LULLABY

From Shakespeare's play A Midsummer Night's Dream.

YOU spotted snakes, with double tongue,
Thorny hedgehogs, be not seen;
Newts and blind-worms, do no wrong;
Come not near our fairy queen.

Weaving spiders, come not here;
Hence, you long-legg'd spinners, hence;
Beetles black approach not near;
Worm nor snail do no offence.

Philomel, with melody,
Sing in our sweet lullaby:
Lulla, lulla, lullaby, lulla, lulla, lullaby:
Never harm, nor spell, nor charm,
Come our lovely lady nigh;
So, good-night with lullaby.

THE VOICE OF THE GRASS

We are not apt to look upon the grass as a thing of life and movement, and yet, of course, it shares the silent, steady life of all the plants. In this little poem, written by Sarah Boyle, the grass is personified as a living thing, with very striking and truthful effect.

HERE I come creeping, creeping everywhere;
By the dusty roadside,
On the sunny hillside,
Close by the noisy brook,
In every shady nook,
I come creeping, creeping everywhere.

Here I come creeping, smiling everywhere;
All around the open door,
Where sit the aged poor;
Here where the children play,
In the bright and merry May,
I come creeping, creeping everywhere.

Here I come creeping, creeping everywhere;
In the noisy city street
My pleasant face you'll meet,
Cheering the sick at heart,
Toiling his busy part—
Silently creeping, creeping everywhere.

Here I come creeping, creeping everywhere;
You cannot see me coming,
Nor hear my low, sweet humming;
For in the starry night,
And the glad morning light
I come quietly, creeping everywhere.

Here I come creeping, creeping everywhere
More welcome than the flowers
In summer's pleasant hours;
The gentle cow is glad,
And the merry bird not sad,
To see me creeping, creeping everywhere.

Here I come creeping, creeping everywhere;
My humble song of praise,
Most joyfully I raise
To Him at whose command
I beautify the land,
Creeping, silently creeping everywhere.

THE LAUGHING BROOK

There is a pleasant sense of brightness and sparkle in this unpretentious little poem by Elizabeth Scantlebury, who knows how to write verse for little folk.

"WHY do you laugh, little brook, little brook,
And why so dimpled and gay?
What did you hear as you came through the wood,
And what did you see on the way?"

"Such fun as I've had! I saw in the wood
The violets opening their eyes,
The little ferns straightening out their curls,
And Jack-in-the-pulpit rise.

"The sunbeams, in passing, threw me a kiss;
The breezes whispered to me;
And the tiny pebbles tickled me so
I couldn't help laughing, you see."

LITTLE VERSES FOR VERY LITTLE PEOPLE

THE Hart he loves the high wood,
The Hare she loves the hill,
The Knight he loves his bright sword,
The Lady loves her will.

REMEMBER, remember,
The fifth of November,
Gunpowder, treason, and plot;
I know no reason
Why gunpowder and treason
Should ever be forgot.

HERE we go round a ginger ring,
A ginger ring, a ginger ring;
Here we go round a ginger ring,
Around about merry my Tansy.

A bowlful of nuts we sat down to crack,
Sat down to crack, sat down to crack;
A bowlful of nuts we sat down to crack,
Around about merry my Tansy.

What will you give us to tell his name,
To tell his name, to tell his name;
What will you give us to tell his name,
Around about merry my Tansy?

The last time is the catching time,
The catching time, the catching time;
The last time is the catching time,
Around about merry my Tansy.

"OLD woman, old woman, shall we go shearing?"
"Speak a little louder, sir, I am very hard of hearing."
"Old woman, old woman, shall I love you dearly?"
"Thank you, kind sir, I hear you very clearly."

MR. EAST gave a feast;
Mr. North laid the cloth;
Mr. West did his best;
Mr. South burnt his mouth
With eating a cold potato.

POOR old Robinson Crusoe!
Poor old Robinson Crusoe!
They made him a coat
Of an old nanny goat,
I wonder how they could do so!
With a ring-a-ting-tang,
And a ring-a-ting-tang,
Poor old Robinson Crusoe!

BETTY PRINGLE had a little pig,
Not very little, and not very big.
When he was alive he lived in clover,
But now he's dead, and that's all over.
So Billy Pringle he lay down and cried,
And Betty Pringle she lay down and died;
So there was an end of one, two, and three:
Billy Pringle he,
Betty Pringle she,
And the piggy-wiggy.

"MOTHER, may I go to swim?"
"Yes, my darling daughter;
Hang your clothes on yonder tree,
But don't go near the water."

OH where, and oh where, is my little wee dog?
Oh where, and oh where, is he?
With his ears cut short and his tail cut long,
Oh where, and oh where, can he be?

THE POOR BABES IN THE WOOD

MY dear, do you know,
How a long time ago,
Two poor little children,
Whose names I don't know,
Were stolen away on a fine summer's day,
And left in a wood, as I've heard people say?

And when it was night,
So sad was their plight,
The sun it went down,
And the moon gave no light.
They sobbed and they sighed, and they bitterly cried,
And the poor little things, they lay down and died.

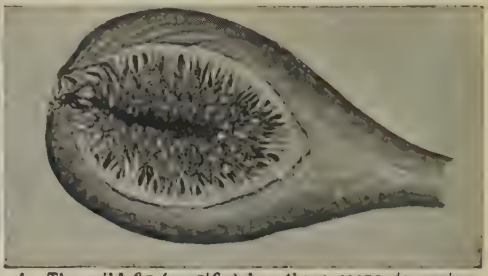
And when they were dead,
The robins so red
Brought strawberry-leaves,
And over them spread.
And all the day long
They sung them this song:
"Poor babes in the wood! Poor babes in the wood!
And don't you remember the babes in the wood?"

THE STRANGE LIFE-STORY OF THE FIG

1. The green objects we see hanging on fig trees are really flower-clusters, not fruits, and this section, cut lengthwise, shows male and female flowers clustered inside.

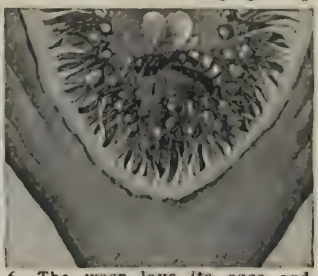
2. The fig has a curious flower arrangement, as if we took a daisy and curled all the florets together inside. This section of a fig, turned inside out, shows the flowers clearly.

3. The male and female flowers are on the same plant, and are clustered in the figs which we see. On the left the male flower is shown magnified; on the right is the female.



4. The wild fig (caprifig) has three crops, in spring, summer and autumn, and a little wasp enters the autumn caprifigs and lives in them all the winter, emerging in spring.

5. By this time the spring caprifigs are ripe and the wasp enters.



6. The wasp lays its eggs and dies, and the new wasp hatches.

7. Here is an egg case, and on the right the young wasp.

8. The young wasp now comes out of the spring caprifig covered with pollen.

9. Looking for a home, it enters one of the edible figs and fertilizes it.

10. Finding no suitable place to lay its eggs, it comes out and enters the autumn caprifigs, but it has pollinated the edible figs and they develop.

Gathering dates in the palm-tops.

FIGS AND DATES

CONTINUED FROM 2068

AMONG all fruits there are two that stand out conspicuously for high food value. They are the date and the fig. Weight for weight, dried figs are more nourishing than bread. A pound and a half yields four-fifths of the nourishment required daily by a grown man; while half a pound of dates with half a pint of milk make a satisfying meal.

The date is really a berry, and the stone inside, unlike the stone of the plum, which is merely a hard seed-case, is the seed itself. The importance of the date-palm is seen by the many references to it in ancient literature. "The righteous shall flourish like the palm tree," sang the Psalmist, using this tree as an emblem of integrity and fruitfulness; "they shall still bring forth fruit in old age; they shall be fat and flourishing"; and we ourselves use the word "palmy" to describe anything in a prosperous condition. Even the Egyptian architects who built the stately temples of Luxor and Karnak could find nothing finer to copy for their great pillars than the upright date-palm with its crown of spreading leaves.

When the seed of the date-palm germinates, the reserve of food stored up in it is converted into sugar by a ferment called cytase, produced by the first green leaves of the plant. Gradually the plant forms fresh cells and increases in height, throwing out leaves; but as the stem grows, the lower leaves die, so that the tree always shows a crown of leaves on top with only the remains of former leaves below. It is these that give the stem of the palm such a rough appearance, and, indeed, the stem may be said to be made up largely of the remains of leaves.

When young the leaves are twisted together and matted up with loose fibres, which open as the leaf expands. Then the leaves split down to the main stalk along the folds, and a fully grown leaf, although large, offers very little resistance to the wind, so that the tree is able to stand firm in the fiercest storm.

The average date-palm grows sixty or seventy feet high, but many reach eighty feet. In the ordinary way the plant is not propagated by seed, but by suckers that spring out of the base of the tree. The palm begins bearing fruit when seven years old, and will go on bearing for two hundred years. A single tree gives from eight to ten bunches a season. So valuable are the trees in North Africa that they pass as wealth from father to son, and often form the dowry of a daughter. A man's social position is largely reckoned according to the number of date-palms

he owns. The date stones are ground up and form a nourishing food for camels, while the fibrous parts of the plant are made into ropes, baskets and mats. Much of the cordage used by ships on the Red Sea is made from the fibrous bark of the palm.

To be fully appreciated, the dates should be gathered ripe and eaten immediately, but for export or for preserving they are laid out on mats and dried in the sun. The large amount of sugar prevents them from fermenting under the process. Dates are also made into jam with sugar by the natives of North Africa, but for this they are gathered before they are fully ripe.

The most remarkable thing about the date-palm is that every tree is fertilized by hand. The male and female flowers grow on different trees, and though a certain amount of pollen might be blown by the wind from the male flowers and find a lodging in the female flowers, this would be too uncertain a process where the food supply of millions of people is involved.

From time immemorial, therefore, it has been the practice for the cultivator to collect flowers from the male tree and, climbing to the top of the female tree, to arrange the male flowers above the blossom there, so that the pollen may fall into the female flowers.

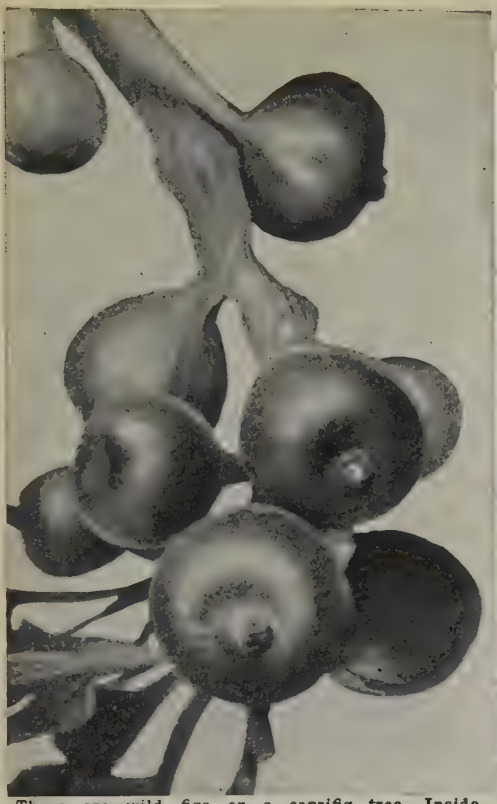
Without this pollination by hand the date-palm will seldom bear fruit. Once during a civil war in Persia one side destroyed all the male palms to deprive the other side of food. The people on that side saved the situation by collecting and storing pollen, so that when times became quieter they were able to fertilize the female blossoms once more.

In case the male flowers should fail, and there should be no pollen to fertilize the female palms, which would mean starvation over wide areas, the natives always preserve a supply from one year to another.

A fig plantation in California, where some of the finest fruit in the world is grown.

The fig is even more interesting than the date. Its life-story has become fully known only during the last half-century, thanks to the studies of American scientists and fruit-growers when introducing the plant into California. The fig is a native of the Persian Gulf countries, and is cultivated all along the Mediterranean shore, as well as in India, Australia and California. The tree grows from fifteen to thirty feet high.

WILD FIGS AND CULTIVATED FIGS



These are wild figs on a caprifig tree. Inside these live the tiny wasps which alone can fertilize the cultivated fig and make it a luscious fruit.

These are cultivated figs. Those on the left have not been fertilized and remain insipid, while those on the right are fertilized and are large and delicious.

The fig, like the date, is a valuable food, and, as can be seen by this tree growing at Orotava, in Tenerine, it bears abundantly. The successful introduction of the fig into America is one of the romances of botany.

DATES GROWING IN AFRICA AND AMERICA

The trunk of a date-palm is made up of the remains of projecting ends of leaves, as can be seen here. The native is bringing down a bunch of dates.

Here the man shown in the previous picture has reached the bottom of the palm, and is handing to another native the bunch of dates he has cut.

The date-palm has been introduced in America with great success, and some of the finest fruit in the world is now grown in California and Arizona, as can be seen by this photograph taken at Phoenix, in Arizona. Although young, this tree is bearing prolifically, and the fruit is easily accessible.

THE WONDERFUL FOOD OF THE DESERT

A fine clump of date-palms in Egypt. In most of the arid region stretching from the Atlantic to the confines of Persia, along the margin of the desert, the date-palm is the only food plant available.

Wonderful clusters of dates on a palm in a garden at Biskra, in Algeria.

It is a relative of the mulberry, the banyan and the india-rubber tree. When a ripe fig is gathered, a sticky milky substance adheres to the fingers, and this is not unlike the milky fluid of the rubber tree that hardens into rubber.

The story of the Smyrna fig, the variety which produces the fine, rich, sweet fruit that we know so well in its dried form, is a wonderful romance. In ancient times it was known that figs came to maturity and ripened properly only when the wild variety, called the caprifig, was grown in the same plantation as the cultivated figs; but why this should be so was a mystery, and so it remained till the end of last century. Even the Romans knew of this mystery, and one of their naturalists, Pliny, suggested that an invisible insect had something to do with it.

Figs are grown in gardens, and there are some people who think their trees produce fruits but no flowers. As a matter of fact, these fig trees produce flowers but no fruits. The pear-shaped objects that form on the tree, and grow larger and larger, are not fruits at all, but flower clusters (inflorescences), and the fig blossom is a very interesting botanical specimen.

THE MAN WHO BLEW THE FIG POLLEN THROUGH A GLASS TUBE

In form it is constructed on the same principle as the daisy and the dandelion and the sunflower. These have hundreds of tiny florets arranged round a centre, radiating to form a disk; but in the fig blossom the small flowers are drawn together to form a pear-shaped bag with the flowers inside. That is the fig, as we see it grow, and, as in some places these flowers are never pollinated, the fruit never forms, and the flower-head remains a flower-head, although, if eaten when freshly gathered in the autumn, it is pleasant. By cutting a green fig through both ways we can see the arrangement of these tiny flowers.

In the end opposite the stalk which holds the fig to the tree is a little hole, and this is the door into the flower-head. In the orchards of Turkey the cultivators plant with the Smyrna fig the caprifig tree which produces pollen but not good fruit; and men cut off the staminate blossoms of the wild fig and hang them in the trees of the cultivated variety, so that the cultivated blossoms may be pollinated and produce rich fruit.

When Smyrna fig trees were planted in California, the figs dropped off, so the growers sent to Turkey for knowledge of the cultivation there. Soon they discovered the curious fact about the need of growing caprifigs in the same orchards, and they did so, but without result. One planter, however, took the pollen from caprifig flowers and inserted this by hand in a few Smyrna fig blossoms, and those figs matured and became sweet fruits. The next year he blew the caprifig pollen into many Smyrna figs with a glass tube, and 150 of them matured and ripened.

The scientists were now on the track of this success, and they found that the tiny insect referred to by Pliny, which was really a wasp, visited both the caprifig and the Smyrna fig blossoms, and as this insect evidently did the pollinating, men began to study its life-history.

THE SOLUTION OF A MYSTERY THAT PUZZLED MEN FOR CENTURIES

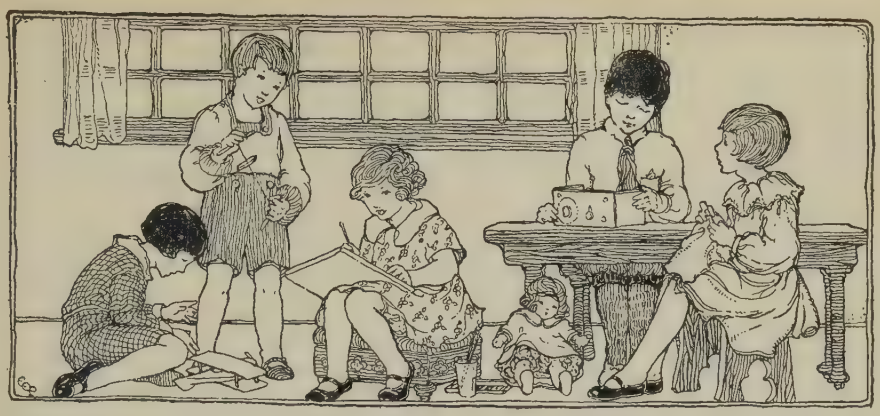
The story is this. The caprifig has three crops—in spring, summer and autumn. The autumn crop remains on the tree through the winter. The little fig-wasp spends the winter in the autumn caprifigs, and then, having exhausted the food in them, emerges in spring and goes into the spring caprifigs to lay its eggs in them. Then the wasp dies, but the eggs hatch out into new wasps, which live in the spring caprifigs till they, too, exhaust the food supply, and come out in search of more. When they emerge, they are covered with pollen from the spring caprifigs.

Deceived by the blossoms of the edible fig, the wasps enter them to find a nesting-place. Finding their mistake, they come out again, but not before they have shaken off their pollen and fertilized the blossom. They now fly about till the summer caprifigs are on the trees, and inside these they lay their eggs. By autumn the new wasps hatch out, leave the summer caprifigs after exhausting the food supply, and enter the autumn caprifigs, where they winter, and the whole story is repeated once more.

THE WASPS THAT WERE CARRIED ACROSS THE CONTINENT

After many unsuccessful attempts the wasps were carried across the Atlantic and across the continent to California, and now that state produces every year a crop of big sweet figs.

THE NEXT STORY OF PLANT LIFE IS ON PAGE 2275.



HOW TO MAKE A STRING BAG

CONTINUED FROM 2048

STRING bags are useful for so many purposes that some of us may like to know how netting, as it is called, is made.

For a first attempt it will be well to make quite a small bag, capable of holding, say, half a dozen tennis balls. This is soon made. We shall require for the work a ball of fine white string, a netting needle, and a piece of wood about 1 inch wide and 12 inches long—an ordinary school ruler will answer the purpose.

The netting needle is made of wood or bone, and is shaped as shown in picture 1, if we cut it ourselves; those sold at the shops are narrower at the waist. They can be bought for a few cents at all big stores and embroidery shops, but from a hard piece of boxwood we might cut out one for ourselves.

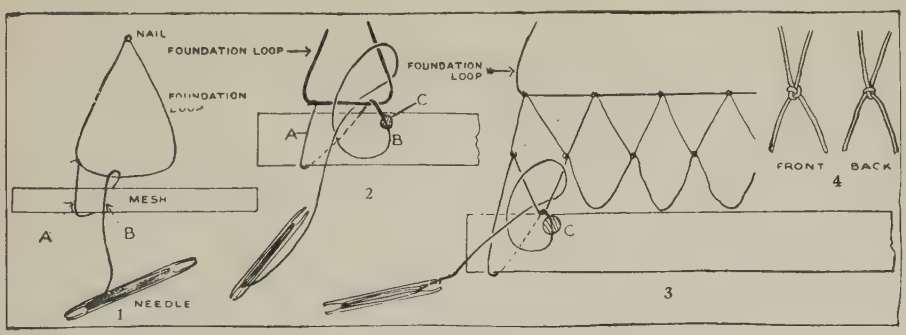
We notice that it is forked at each end; this is to enable us to wind the string on it. Its length is 5 or 6 inches, and it can be ¾ inch wide—or less if we like. The string must be wound on very tightly and not much of it at once, so that the needle will slip easily through the loops we have to make. The flat piece of wood, or ruler, is called the mesh.

Netting is formed by a series of loops knotted evenly. The mesh and needle help us to form equal loops and tight knots.

To begin, we make a *foundation loop* of a separate piece of string about 10 inches long, its ends being knotted together. We slip this over a chair-knob, or a nail, or anything to which we can give a good pull, and which will be a convenient height for us.

Having arranged the foundation loop with an ordinary knot, we fasten to it the end of the string which we have wound on to the needle. Then, taking hold of our mesh with the left hand, we wind the string, marked *A*, from the needle once round the mesh, passing through the foundation loop, as shown in picture 1. We now draw the mesh up to the foundation loop, and place the first finger of our left hand upon the string *B*, at the point *C*, shown in picture 2. We next cast a loop of the working thread, and pass the needle to the right of the foundation loop, between it and the mesh, and through the loop we have just cast.

This enables us to form a knot, which we can then draw tight against our first finger. The finger should be kept on the



The netting needle and different stages of the netting stitch.

string *B* until this is done, and we must *draw the string toward us*, not up. This is very important.

This may sound complicated, but it is really quite simple. Picture 2 should make it quite clear. After a little practice we shall be able to do it very quickly. Picture 4 shows the front and back of the knot, or stitch, and if our knot does not look like this it is probably because we have not pulled the string *toward* us.

Fifteen stitches, or loops, are cast on to the foundation loop in this way, and the mesh is then slipped out and removed while we give our foundation loop a complete turn on the nail.

We must turn our work over so that we begin to work on the left-hand side again, but at the same point at which we finished off on the right. Picture 3 shows the strip turned ready for the first stitch on a new row. We continue the next row in the same way, only taking up a separate loop instead of the foundation thread.

The whole bag is made in this way, row after row of knotted loops worked from left to right, *always turning our work on the nail* after each row.

After about twenty-five rows we shall find our strip of netting long enough to make a tennis-ball bag when doubled in half and joined up at the sides. To do this we slip our mesh out of the last row and neatly cut off our needle-string. Then we take out the foundation loop, and join up the sides as though we were sewing it, using our fingers as the needle, poking our string through the loops and joining with a knot top and bottom.

The bag is then complete, all but the draw-string at the top. This is simply threaded through the loops which form the mouth of our bag, and looks better if made of string of another color—red or green will do, of a slightly stouter kind. It should be about 20 inches long, with the ends simply knotted after we have threaded it through the loops at the neck of the bag. We could make a tennis-net or a fishing-net by this method.

MORE GAMES TO PLAY OUT OF DOORS

HERE are some more games for boys and girls to play out of doors. Some can be played on the lawn; others are more suited to the playground.

TUG OF WAR

A STRONG, long rope is laid on the ground across a chalk line. The players are then divided into two parties, one side taking up the rope on one side of the line, and the other the opposite side. At a given signal they pull against each other with might and main. The side that draws the enemy over the line are the victors.

LEAP-FROG

THE frog bends down with his hands on his knees and his back up. The leaper runs toward him, places both hands on the bent back and, spreading out his legs, passes over, to come down on his feet the other side. Running a short distance, he bends in turn, and he who has lately been frog goes over him in the same way. If a number of boys play, it becomes great fun, for as each one goes over he runs and bends, so that there are many backs to leap before a turn comes to stoop.

A SACK RACE

IN this race each runner puts his feet into a large sack and draws the top of it together round his body, where it is tied with string. Before beginning to run it is best to push your feet well into the opposite corners of the sack, so as to have as long a step as possible, and not to try to go too fast. If you go fast you may fall, and it is not at all easy to get on your feet again once you are down.

FIELD GOLF

WE are going to play golf in a new way, which is quite simple, but very good fun. Choose a starting-point in a large field and dig there a very small hole. One hundred steps away, in a straight line from this, we make another hole in the ground. Then, at the end of another hundred steps, another hole, and so on until we have gone round the field and are back at the starting-point. These holes mark our golf course. Each player is armed with a club-ended stick and a small, hard rubber ball. The game is to strike these balls round the course, knocking them into each hole as it is reached. The one who does this and gets round to the starting-point with the fewest strokes wins. Each player, of course, hits only his own ball. The starting-place should also be used as the last hole.

THE TRAVELER AND THE WOLVES

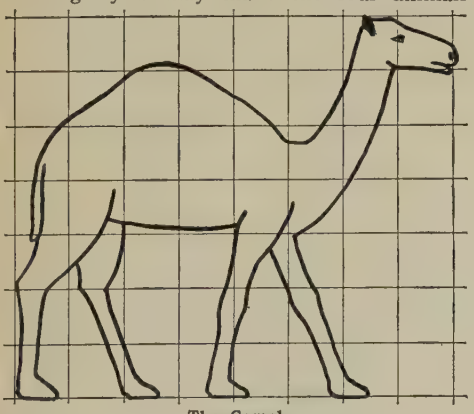
THE smallest boy or the slowest runner is the traveler, and the traveler has to get to his journey's end without being caught. The rest of the players are the wolves. Before setting out on his journey the traveler is given as many tennis balls as there are wolves.

When he has got some distance away, the wolves roar out that they are coming, and the race begins. When the traveler finds a wolf overtaking him, he throws out one of the balls, which the wolf must secure before he can take up the race again. Of course, the traveler's object should be to throw the ball in a way that will lead the wolf from the direct path. Thus, he should never throw it in front, or the swifter runner will pass him to secure it, and then merely wait for him to come up. Knowing what the traveler is going to do, the wolves will probably spread out a little to either side in the hope of stopping the balls more quickly. Therefore, the traveler should do his best to find out where the nearest wolf is, and the more skill he shows in managing the balls, the greater will be his chance of escape. Above all, he should not throw them away too soon.

If the chances against him are very great at the start, he might be provided with more balls than there are wolves. Of course, a distant spot should be chosen as a goal.

MORE WILD ANIMALS FOR YOU TO MAKE

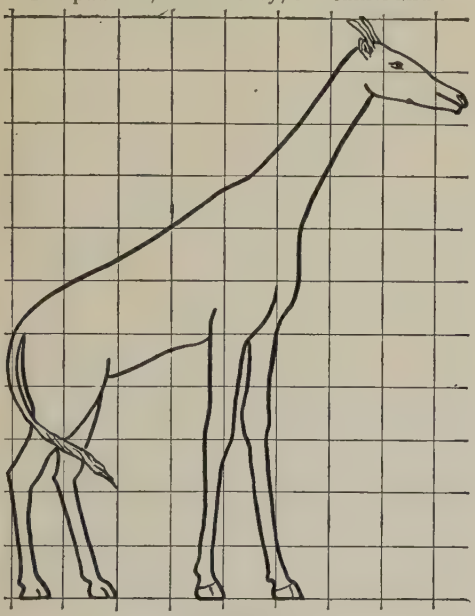
YOU have already learned how to make several wild animals with bases to help them stand up, for your circus or menagerie, from the directions given on page 511. Perhaps you preferred more lively and lifelike toys and became interested in the directions for making the jointed animals given on page 895. Although you may make the four animals



The Camel.

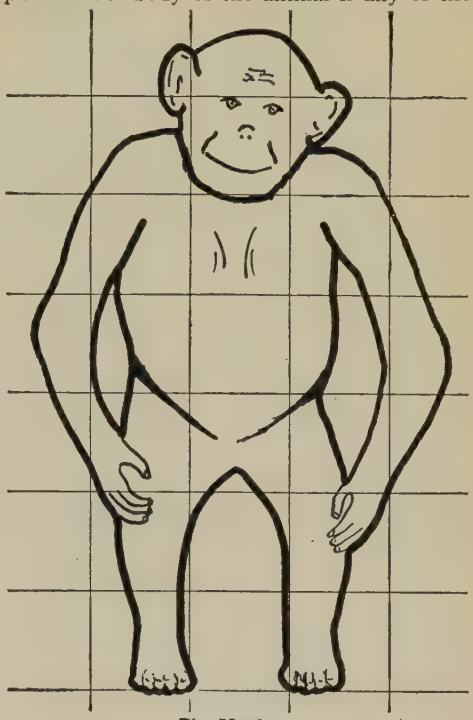
shown in the pen drawings on this page just as you have made your other ones, perhaps you would prefer to have these and some of your others on wheels. Of course, if you have made the jointed toy animals you will not care to mount these, as it would then be difficult for them to do "stunts."

The panther, the monkey, the camel and the



The Giraffe.

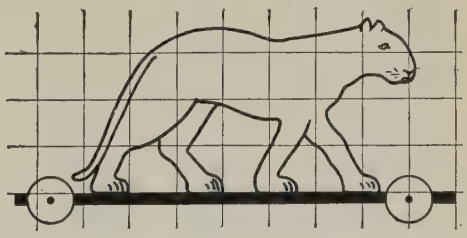
giraffe as shown in pattern form herewith may be enlarged as previously directed on page 895. It is suggested that care be taken in making your drawing or pattern, as it will be found difficult to cut out the legs and other parts of the body of the animal if any of the



The Monkey.

members are made too fragile. For this reason you will do well to use light packing boxes rather than cigar boxes to supply you with a suitable wood.

In case it is desired to mount these or any of the other animals on wheels, this may be most easily done if you are able to secure four small spools, such as twisted silk spools, which must



The Panther.

be of the same size. As shown in the pattern of the panther, small wood disks may be made for this purpose. In either case the small wheels should be nailed or screwed to the sides of the base as shown. The base should be made long enough so that the wheels may be placed far enough apart to balance the particular animal in question.

You are referred to pages 511 and 895 for directions as to the methods for planning, constructing and finishing these toy animals.

LITTLE PROBLEMS FOR CLEVER PEOPLE

WHICH IS THE HEAVIER?

1. "Which is the heavier," asked Herbert, "an ounce of gold or an ounce of feathers?" "An ounce of gold, of course," replied his sister Maud. "But a pound of feathers is heavier than a pound of gold," said Herbert. Was he right?

WAS IT QUICKER TO CYCLE?

2. James and John are cycling from Springfield to a village 20 miles distant, and when they have gone only 4 miles John's machine breaks down. They wish to reach their destination at the same time. They can both walk or they can use the cycle alternately. They can walk 4 miles an hour and cycle 8 miles an hour. Which is the quicker way and how long does it take?

How did Charlie know the way?

WHICH ROAD DID HE TAKE?

3. Charlie started from his home intending to cycle to a village 10 miles away. He came to crossroads and found that the signpost had been pulled up and lay in the middle of the road. Yet he made the signpost tell him which was the proper way to go. The post was of the usual kind with four arms, upon which were painted the names of the principal villages to which the four roads led. Such signposts may be seen wherever there are crossroads. How did he do it?

HOW LONG WERE THE CANDLES BEFORE THEY WERE LIGHTED?

4. I had two candles, one an inch longer than the other. I lighted the longer at 4:30 and the shorter at 6. At 8:30 they were both the same length. The first burned out at 10:30 and the second at 10. How long were they before I lighted them?

HOW LONG WAS THE TELEGRAM?

5. A man sent a telegram from New York to Albany. If he had sent it to London it would have cost him 25 cents a word, and the total cost would have been $1.25 more than he paid. How long was the telegram?

HOW MUCH WAS SPILLED?

6. A boat leaving a wreck had water to last 13 days, allowing each man one quart each day. After 5 days some water was spilled, and one man died on the same day. The water then lasted just the expected time. How much water was spilled?

HOW MANY TRAINS?

7. A train leaves New York for San Francisco every morning at 9 o'clock, and another leaves San Francisco for New York every morning also at 9 o'clock. Each train takes exactly 5 days to make the journey across the continent.

If I travel in one of these trains, how many trains shall I pass coming in the opposite direction?

WHICH FARM WAS THE BIGGER?

8. A farmer in Canada boasted that he had a farm of 4 square miles. Another farmer, who heard him, said: "My farm is bigger than yours. It is 3 miles square." Was the second farm really the bigger?

WHEN WILL HARRY HAVE A CYCLE?

9. Harry, aged 12, is promised a bicycle when he is one-third the age of his father, who is now 56 years old. When will Harry get the bicycle?

THE ANSWERS TO THESE PROBLEMS WILL BE FOUND IN THE SECTION BEGINNING ON PAGE 2259.

THE PROBLEM OF THE MAGIC SQUARE

IN olden times magic squares were thought to have special virtue, and were used or worn as mascots to keep off disease or bring good fortune to their possessors or wearers. The peculiar feature of a magic square is that, whether the figures in it be added up by vertical columns, by horizontal rows or by the two diagonals—that is, the sloping columns from opposite corners—the total is the same in every case. Here is a square which is not a magic square, because the figures that make up the vertical columns, the horizontal rows and the diagonals do not, when added up, make the same totals. But by cutting the square into four pieces, and putting these four pieces together again in a different way, a magic square is formed in which the addition of each row, each column and each diagonal gives in each case 34, neither more nor less. This is one of the interesting puzzles propounded by Mr. Henry E. Dudeney in his interesting book of problems called Canterbury Puzzles. How can it be done?

1	15	5	12
8	10	4	9
11	6	16	2
14	3	13	7

The answer will be found on page 2266.

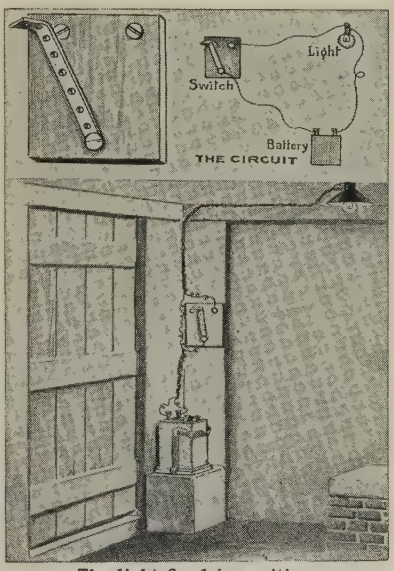
HOW TO FIX A CELLAR ELECTRIC LIGHT

AN electric light can be fixed up in a cellar, storeroom or any other small chamber, with little trouble and expense. A few things have to be bought, such as the wire, bulb and battery, but the switch can be made out of odds and ends, and the whole arrangement should cost less than one dollar. The convenience of having a light in the cellar or in a dark storeroom, with a switch handy at the entrance, is obvious, and any intelligent boy can fix it up.

A small bulb, a socket and a reflector are sufficient. If you prefer an accumulator you can get one which can be recharged from time to time. Flex wire, in which two wires are twined together, is the most convenient sort to use.

The first thing to decide is where the battery is to go, and this should be kept either out of the way on the floor or on some convenient shelf. The light can be arranged on a beam of the ceiling or on the wall, and the switch by the door in the most easily accessible spot for the hand. You must next plan the best route for the wire. It is always well to carry this, as far as possible, along angles of the wall, where it is not likely to be knocked and damaged.

Then you make the switchboard. Take a piece of wood about 1½ inches by 2 inches, and ½ inch thick. Place two brass screws at the top, one on the right to make the connection and one on the left to act as a stop for the switch. The switch can be a piece of stout wire with some spring in it, a strip of zinc, or, best of all, an eleven-hole strip of meccano. The top should be bent over to make a handle, and the bottom attached to the board by a small brass screw.



The light fixed in position.

Everything should now be ready to begin the wiring. Unwinding a little of the flex wire, fasten one strand to one pole of the battery and the other strand to the other pole. Then carry the wire to the switchboard, separating the two strands, and fixing one to the lower screw on which the switch works, and joining the other broken end to the top right-hand screw where the connection will be made by moving the switch. The double wire is then carried to the light, one end being fixed to one terminal and the other end to the other terminal.

The whole arrangement is thus complete, and if the switch is turned over to touch the top right-hand brass screw on the switchboard the light should shine. By turning the switch to the left the light is extinguished. The pictures should make it all quite clear. An accumulator or storage battery is more powerful than a dry battery. It will support a more powerful lamp and can be recharged when weak.

A GAME TO PLAY AT A PARTY

TWO captains, A and B, are chosen, who in turn select their teams. The players all gather around a long table, one team on one side with its captain at the head, the other team on the opposite side, headed by its captain. A quarter is the only thing necessary for the game.

A's side takes the coin first and passes it under the table from one hand to another without being seen by the opponents. One member of the team takes the coin and conceals it in the palm of his hand in such a way that when the hands are placed on the table, the others cannot tell where it is.

Captain B of the opposing side then calls, "Jenkins says, Hands up!" when all the members of A's team must bring their hands up, with fingers tightly closed, and place their elbows on the table. B's team may then look over the hands and try to locate the coin which is hidden in one of the hands. After a few minutes of guessing, the captain then gives the order, "Jenkins says, Hands down!" when all hands must be slammed flat on the table, palms downward. Each one tries to make as much noise as possible to hide the sound of the coin as it strikes the table.

The object of the game is for the opponents to guess under which hand the coin is hidden. B's side then consults as to where the coin is, judging by the look of the hands. The captain of the guessing side then orders the hands not holding the coin to be removed one at a time, specifying whether it is the right or left hand that is to be lifted.

If the guessing side is successful in eliminating all of the empty hands so that the coin is left under the last hand, then that team wins, and the coin is passed over to B for the next round. If a player obeys the orders of a member of the opposing team who is not the captain, his side forfeits a point. If the coin is disclosed before the last hand is reached, then the side holding it adds to its score the number of hands remaining on the table that were not ordered off. The side that scores the greatest number of points in a given time is winner.

WHAT PLACE ARE WE IN?

THE GAME OF "WHERE IS IT?"

HERE is a game to play while we are sitting round the fire on a cold winter's day. One boy reads out the descriptions given below, and the game is to guess the places.

The answers are given in that part of our book beginning on page 2259.

THE CITY OF CROWDED STREETS

How hot it is! The sun's rays beat down from a cloudless sky so fiercely that our eyes turn with relief to the broad river speeding by eastward. Low down on the banks are crowds of people with brown skins, and here and there some wearing white turbans. They are bathing in the water and crowding up and down stone steps leading to curious little buildings. Can these be little temples? Further along the banks steamers are busy loading indigo and saltpetre to take away to England. All around we hear strange speech, and we look in vain for clean streets. How narrow and crooked they appear!

THE CITY OF THE GOLDEN DOME

It is winter, and we are in a big city where the streets are deeply covered with snow; there is no sound of vehicles, only the tinkling of sleigh-bells and voices to break the silence. The shops have signboards and objects hung outside to tell what they sell, because many of the people cannot read, and certainly we cannot recognize the letters. We follow the way the sleighs take and come to a cathedral with a golden dome and wide granite pillars at the entrance. In front is a river—but a river frozen over. The ice will bear carriages; it will stay there till the spring, and when it melts there will be a religious ceremony and a blessing of the waters.

TREES FOR EUROPE'S SHIPS

We are in a country covered with thick forest, so dense that it is only with great difficulty that we can make a way through it. Hark! That must be men sawing wood and chopping down trees, and a young Englishman wearing a white helmet is directing them, and—why, yes; those big animals working so hard are elephants. They are piling up the big logs with their strong trunks as though they were handling little sticks, and others are dragging along the chained trunks. The Englishman tells us they are clearing a way for a railway through the forest, and the teak trees they are cutting down are going to countries in Europe to be used for building ships. He says there are nearly twenty thousand square miles of tropical forest, and that some tigers and leopards have been seen near. Do you know what country we are in?

WHERE STARS COME QUICKLY

What a flat mountain! It looks as though a giant plane had been used to cut off the top. The mist lies like a white dining-cloth on it and dotted about the lower slopes and nestling under them are pretty low houses surrounded by verandas and sheltered by trees. Arum lilies are growing wild, for the air is quite warm. Away over the sea the sun is setting, and a large vessel is steaming out of the harbor to make its way northward to England. Perhaps it is carrying diamonds, feathers, wool or wine.

The town reminds us of a Dutch one, but the cathedral is English, and there are plenty of English names over the shops. Night comes quickly, and the stars soon appear; but we look in vain for the Great Bear.

SIX RIVERS FLOWING INTO A BAY

These people must be English, for we understand what they say and could easily ask where we are; but let us see if we can find out without troubling anyone. Before us lies a fine stretch of water inclosed by land on the west, east and north, and with half a dozen little rivers flowing into it, somewhat like fingers joined on to the palm of a hand. And do you notice that long, long wall in the distance with a lighthouse at one end? Big steamers from Asia and Australia are at anchor in this harbor. "Boom!" goes the midday gun in the fort on little Drake's Island.

It is going to rain, so let us explore the lighthouse close by. The man in charge takes us up it, and tells how it was brought in pieces from a rock fourteen miles out to sea, where a new lighthouse now stands. We face about landward and look down over the town at the hills, rivers, and blue moorland in the distance.

IN THE TRAIN FOR DAYS

We are standing among wheat which grows all around us as far as our eyes can see. The land is very flat, and the air pure and sweet. About a mile away is a large wooden farmhouse. In the distance we see the smoke of an engine. It is coming nearer; now we see the train, and notice it is made up of large Pullman cars, and that the engine has a "cow-catcher" in front. The passengers have been in the train for days, taking their meals and sleeping in it; and before leaving it some will have traveled right over high mountains among snowy peaks, where the brown bear hides away. What is the railway?

WHERE THE COCONUTS GROW

We seem to be on an island in the midst of a big sea, for there is water everywhere, except here and there where small islands are scattered about. We are standing on a beautiful white sandy shore dotted with lovely colored shells. It is only one o'clock in the day, yet when we look at our little pocket compass and then at the sun in the sky, we find the sun is to the north of us.

Away inland the ground rises in terraces, forming a kind of amphitheatre, up to the highest point in the middle of the island, which looks about 8,000 feet above the sea, and reminds us of a broken-down volcano. We turn up one of the gorges, and see palm trees and coconuts growing on them, great tree-ferns, sugar-canes and oranges. Brown-skinned natives tell us in broken French that they dive for oysters to get mother-of-pearl.

THE NEXT THINGS TO MAKE AND DO ARE ON PAGE 2259.

Crossing the shifting sands of the desert.

THE FACE OF THE EARTH

CONTINUED FROM 2075

WHEN we look at a map of the world to-day we see many patches of different colors showing the land, and a much larger quantity of blue for the water.

We see the great continents of Europe, Asia, Africa, America and Australia, together with thousands of islands near the land and in the ocean, all surrounded by masses of water great and small—the seas and oceans. It looks a little haphazard; but every coast-line was carved by the unfailing operation of eternal law, and every ocean floor is the certain result of great natural processes.

Under other conditions there might have been a world all water or all land. All the mountains and continents of the world to-day might have been buried in the deep oceans. There might have been one continent; there might have been millions of islands; but under the material conditions which molded its surface, the earth was ordained to become as we see it to-day.

The earth's face measures 197 million square miles, of which the sea covers 142 million miles, and the land only about 55 million miles. That, however, does not show the true excess of water over land. The outside of the earth's crust is very much like an orange skin—generally round but rough, with low places here and higher parts there. The depressions far exceed the projections, and if the whole of the solid surface were to be leveled, it would be nearly a mile and a half lower than the present sea-level. If both sea and land were brought to one level, the whole of the land would be covered by the sea. The slightest rise, indeed, of the whole ocean floor would submerge hundreds of thousands of miles of land.

As everyone knows, sea-water is salt, but the surface water is not equally salt all over the world. The Mediterranean Sea is very salt. The Atlantic varies enormously. North and south it is less salt than elsewhere; then come two belts of rather salter water, then two bands still more salt, and in the middle it is less salt again, while in the Gulf of Guinea the water is the same as in the north and south.

On an average, every hundred pounds of sea-water contains about three and a half pounds of salt and other solid matter in solution, and if all this were taken out and spread over the land it would cover an area of seven million square miles to a depth of a mile.

If we could look at the earth from some other world in the sky we would see how very unevenly the land and water are distributed. Most of the

dry land is in the northern hemisphere and the water in the southern. In the north there are 38 million square miles of land to about 60 million miles of water. In the south there are only about 13 million square miles of land to 85 million miles of water. Usually our atlases show the world divided into an eastern and a western hemisphere. Here, again, the difference between land and water in the two halves of the world is very marked. In the eastern half there are about 35 million square miles of land to 64 million miles of water, and in the western half 16 million miles of land to over 81 million miles of water.

WHAT WE SHOULD SEE, LOOKING AT THE EARTH FROM ANOTHER WORLD

It is possible, however, to take a globe of the earth and divide it so that most of the land comes into one half, with London as its centre; and most of the water into the other half, with Auckland, New Zealand, as its centre. Then we find that in the land half there are over 43 million square miles of land to over 54 million miles of water, while in the water half of the world there are only 8 million square miles of land to about 90 million miles of water.

If we were looking at the earth from a distant world we would notice another striking thing about its surface. Apart from the contrast between land and sea, the land itself would appear to be divided into a number of distinct belts. First of all, round the North Pole would be a white belt representing a region of eternal snow and ice. This is the great frozen Arctic, where few plants grow, where animal life is a struggle, and where man can scarcely live. It is a great white area over 8 million square miles in extent.

THE GREAT TUNDRA BELT THAT STRETCHES ROUND THE EARTH

Then comes a belt, right round the earth, of what is known as tundra—low, swampy plain stretching away from the Arctic Ocean to the forest lands. It is covered for the greater part of the year with snow, and the ground, except for the top few inches in summer, is always frozen hard. But for a few weeks it is covered with small flowering plants, and in sheltered places we may even find wild strawberries. A great part of northern Siberia and northern Canada consists of tundra and it is interesting to note that this kind of surface is peculiar to the northern hemisphere. In the south the land does not reach far enough down to the Antarctic for tundra to exist.

Next to the tundra comes a great green belt of forest land, beginning nearest to the tundra with a few stunted willows only an inch or two high. It gradually develops toward the south into great timber forests of cone-bearing trees. There many wild animals find a home and a living, some feeding on the herbage and others preying upon animals smaller and weaker than themselves.

When we come to more thickly peopled and civilized lands, the forest belt is smaller. In Europe and China and America large tracts of forest have been cut down, and in their place we have the prairie, the grain lands, the fruit orchards, the vegetable gardens and the rice-fields.

The next belt is not continuous round the land surface, like the ice-field and the tundra. It is the great silent desert belt beginning in China with the desert of Gobi, a part of the mysterious heart of Asia. It reaches right across Central Asia to Persia and Arabia, and then across Africa as the vast Sahara. It crosses the Atlantic, but in America it is not so large in extent, though there are sandy deserts in Colorado, California and Arizona.

THE BIG CITIES AND BEAUTIFUL TEMPLES THAT LIE UNDER THE SANDS

In America something is being done by gigantic irrigation schemes to lessen the desert area, but in the Old World there seems no doubt that the desert region is increasing. Explorers have found that in the desert of Gobi the sands cover big cities and beautiful temples and great commercial highways, which were once the busy scenes of a flourishing people. Even within living memory lakes have become smaller or dried up, rivers have disappeared, and the terrible sand has crept nearer and nearer the dwellings of men. The desert grows like a plague, and nothing seems able to stay its ravages. The same thing is happening in Persia and Arabia, and probably also in the Sahara. It is all due to the well-known fact that the earth is slowly drying up.

The great desert of Sahara covers an area of about three million square miles, broken only here and there by a few grassy spots called oases. It is not, as is so often supposed, a huge sea of almost

level sand. There are rocky heights, great moving sandhills and ridges, and deep depressions, and probably no part of the earth's surface is so difficult to travel over, unless it be the other great desert of Gobi, which covers a million square miles. Altogether there must be about six million square miles of sandy desert in the world. In the southern hemisphere there is a similar, though smaller, desert belt running across the land surface of the globe. We find it in the centre of Australia, in the Kalahari region of South Africa, and, on the other side of the world, in Chile.

Between the northern and southern desert belts comes the great tropical belt, where plant life runs riot, where growth is rank and rapid, and where forests are so thick as to be almost impossible to enter. There live the great reptiles and the fiercer mammals; there spiders grow as big as birds, and birds as bright as rainbows; and there man is almost helpless. If he clears a path through the forest to-day, it is grown over again to-morrow. In South America the tropical forest extends over perhaps two million square miles.

In the southern hemisphere there is, of course, a region where pastoral and horticultural pursuits are carried on, and whether it be in Australia, South Africa or Argentina, this land is constantly being increased to produce food.

Farther south is the great waste of waters called Antarctica, another region of eternal snow and ice more than twice as big as the Arctic. The explorers Scott, Shackleton and Amundsen have peeped at it, but we know very little about it as yet. You may read about these famous men on page 5089.

Of course many of the areas described are subdivided into others. Thus we have the *steppes* of Russia and Central Asia, great open and treeless plains; the *savannahs,* or prairies, of North America; the *llanos,* or grass flats, of the Orinoco River; the *selvas,* or forest plains, of the Amazon valley; the *pampas,* or broad grassy pastures, of La Plata; and the *landes,* or sandy plains, of southwestern France—names which are constantly cropping up in books. You will be glad to know them.

The shape of the earth has been of tremendous importance to the evolution of animal life and plant life and to the history of man. The distribution of land and sea, of deserts and mountains and plains and rivers and bays, is one of the main factors that make the earth's climate, and on climate depends the life we live to-day.

THE ROCKS AT PENINNIS POINT IN THE SCILLY ISLANDS

Cotton does not grow in Maine, nor rubber in Nova Scotia; we do not find humming birds in Iceland, nor reindeer in the Sahara. It is chiefly the shaping of the earth, together with the tilt of its axis, that has given the world such a wonderful variety of climate and of life.

But, even apart from the important question of climate, the shape of the earth has had a great influence on the evolution of life, for it has meant the separation, by mountain ranges and seas, of animals and plants. Nature has forced islands and continents to keep to themselves; and the result has been that each land has had its own special life-story, its own special struggles against other lands, and its own special selection of breeds. Think how many there are, both dark-skinned and white. We have the yellow races of the East, the red men of North America, the

black races of Africa, the Aryan races of Europe, each with special kinds of minds and bodies. We find kangaroos in Australia, camels in Africa, llamas in South America, bisons in North America, and polar bears in the Arctic regions. Had the dry land been all in one piece, many of its present species would have been killed in the early stages.

If, again, the land had been divided into small islands, there would probably have been a greater number of species, but many of the forms of life favored by deserts and jungles and plains would not have developed. Even the smaller differences between nations are due largely to such physical causes. The French and the Spanish would probably have intermarried much more if there had been no mountain range between them, and would have been more alike. Even the differences between the Scottish, English and Irish races are due partly to geographical separation.

How much the United States owes to the fact that it is a continent-wide country it would be difficult to say; but certainly the character of its people and their achievements in the world would have been very different if they had been but a group of small islands lacking great food resources, mineral wealth and a need for wagons to cover long distances.

But now Nature seems to have almost finished her method of evolution by separation; now everything seems to be making for internationalism and cosmopolitanism. Science is shifting natural boundaries; it pierces the grim mountain ranges, it crosses the ocean, it makes a Simplon tunnel here, a Panama Canal there. It brings Manitoba's wheat to India, California's fruits to Maine, and Pennsylvania's coal to Oregon. It brings black men to France and white men to Kenya. It plants cotton in New Guinea and tobacco in Connecticut. Every steamer, every new railway line, every airplane, every bridge, every tunnel, every canal breaks down the divisions made by Nature when she molded the face of earth in its present configuration.

THE ENDLESS VARIETY AND MANIFOLD BEAUTY OF THE WORLD

The railway train, the motor car, the liner and the airplane have given the whole world to the traveler. A man may climb into an airplane in New York and the next day he may breakfast under California's sky. He may climb Mount Washington on Monday and a cliff-dwelling on Friday. He may go to Cape Horn in his summer holidays, or spend a week-end in the Bermudas.

Nature, in molding the face of the world, has provided man with an endless panorama of beauty. California and British Columbia show more beauty and more variety of scenery than a man can exhaust in a lifetime. From the coral shores of Florida to the lava flows of the Snake River, from Maine's granite coast to the Imperial Valley's irrigated gardens, America shows a succession of beautiful hills, plains, valleys, lakes and rivers unsurpassed in the world. The Green Mountains, the Appalachians, the Ozarks, the Rocky Mountains, the desert ranges of Utah, the Coast Ranges all have their characteristic beauty and grandeur. The Maine lakes, the Finger Lakes, the Great Lakes and Lake Louise all have their own loveliness. The Kennebec, the St. Lawrence, the Mississippi all have their own color and music and character.

THE WORK OF AN INFINITE CREATOR THAT IS FOREVER GOING ON

The rivers have cut out their own glens, each like a picture by an inspired painter, now purple with heather, now tawny with dead bracken, now green with young grass, now golden with corn. Nature hacks and hews, but she hacks and hews as a great sculptor. She destroys to create and beautify. It is the weathered rocks, the crumbling coasts, the excavated river courses that give the world its beauty in our eyes, and in color and shape there is no end to variety.

If we are weary of rivers and lakes, we may travel for a thousand miles over the Canadian prairies or the Sahara Desert or the Russian steppes. When we are tired of deserts, we may explore the tropical jungles; and if these pall, we may visit the volcanoes of Hawaii or the icebergs of the polar seas. Deserts, mountain ranges, prairies, meadows, glaciers, ice-fields—Nature has given us all these in rich measure. If, in one sense, the face of the earth is a book of history, it is also a book of beauty.

Nature's book is still being written, her pictures are still being painted, the rocks are still being carved. Anyone with seeing eyes may observe the divine pen and brush and chisel of the Creator at work.

THE NEXT STORY OF THE EARTH IS ON PAGE 2313.

GRAND FALLS, NEW BRUNSWICK

THE ALBERT FALLS NEAR PIETERMARITZBURGH, NATAL

GREAT CONTRASTS OF CLIMATE

The tropical verdure of Guam in the Pacific.

Mont Blanc, the highest mountain in Europe.

Maloja Pass in the Alps, leading from Switzerland to Italy.

SCENES OF PEACE AND GRANDEUR

The Grand Canyon of the Colorado, Arizona.

The woods of Cobham Park in Kent.

The wooded country by Loch Achray in the Trossachs of Perthshire.

THE EARTH'S VARIED SURFACE

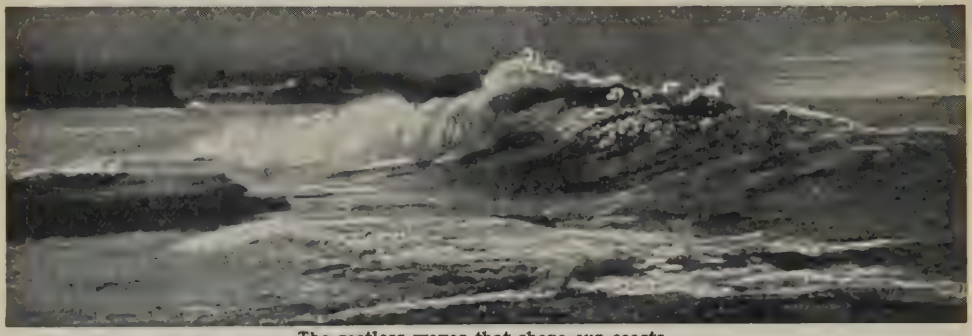
A river winding through a plain.

Stromboli in eruption.

Bosson Glacier on Mont Blanc.

Aisle of Pines in New Forest.

Mount Pelée Volcano, Martinique.



The restless waves that shape our coasts.

A New Zealand mud volcano.

Loch Muick in Aberdeenshire.

Photos by New Zealand and South African Governments, Messrs. Donald McLeish, Underwood, Valentine & Sons, E. C. Youens.

Italian settlers gathering coffee in Brazil.

HOW COFFEE COMES TO US

CONTINUED FROM 2026

WHETHER you drink coffee or not, you know that millions of people all over the world have one or more cups every day. If you will look in the index for the word caffeine, you can learn of the important thing in the drink, and of the effect of coffee upon the human body. Here we shall tell you how coffee comes to the table.

WHEN MEN FIRST BEGAN TO DRINK COFFEE

Just when men began to drink coffee we do not know, but at least five hundred years ago it was well known in Abyssinia. There are many stories of how the effect of the plant was discovered, but no one can be certain about the matter. One story is that some sheep ate the leaves and could not sleep afterward. The practice of drinking coffee spread over the East, and Europeans brought back stories of the wonderful drink. Soon after 1650 "coffee-houses" were opened in several European cities and became very popular. King Charles II tried to close them in England because people talked politics while sipping the fragrant beverage and "spread abroad divers false, malicious and scandalous reports."

King Charles did not succeed in closing the coffee-houses, and, in spite of all opposition, more and more men learned to like coffee. Nations differ very much, however, in the amount of coffee they drink. The United States uses more coffee than any other nation, but according to population Holland drinks most. The people of Sweden, Norway, Germany and France also drink a great deal. On the other hand, the people of the British Empire drink more tea than coffee, except in South Africa, where so many of the people are of Dutch blood. In proportion to population Canada drinks more coffee than Great Britain, but on the whole still prefers tea.

THE COFFEE PLANT GROWS IN MANY PARTS OF THE WORLD

The coffee plant is an evergreen shrub which may grow as high as twenty feet, but is seldom allowed to become more than six or eight feet in height. It flourishes in warm countries all over the world. From Africa it was taken to Arabia, then to India and to the islands of the Pacific and Indian Oceans. Coffee from Arabia is called Mocha. Mocha and the coffee grown in Java are highly prized. The New World, however, produces more than the Old. Coffee is grown in the West Indies, Mexico, Central America, and in several countries of South

America, but four states in Brazil produce much more than all the rest of the world together. We shall tell you, therefore, how coffee is produced in South and Central America. Coffee grows on many kinds of land, but in Brazil the gentle slope of a hill or a mountain about two thousand feet above the sea is preferred. Trees are planted in rows, and begin to bear when three or four years old.

Following the beautiful fragrant white flowers, fruits resembling small cherries appear along the twigs. These are often called coffee berries. They ripen six or seven months after the flowers appear, and generally contain two coffee beans with the flat sides together. Each bean is covered with a "silver skin," and the two are held together by a thin membrane. Around all is a sweet yellowish pulp covered by a thin skin which turns dark red when ripe. The crop does not appear all at one time, but the shrubs bear flowers and ripe fruit at the same time, and the berries are picked several times in a season. One kind of coffee bean is nearly round, and the berry contains only one bean. Not very much of this is grown.

How the beans are freed from their covering

When the berries are picked they may be treated by the wet or the dry method. In the wet process, the berries are raked and shoveled in water until clean and soft. Then they are carried by a stream of water through a machine which breaks the skins and rubs off much of the pulp, but does not break the thin membrane which holds the two beans together. This loose pulp and the skins are carried away by the water. When the remaining pulp has become soft and loose, the berries are spread out to dry. When very dry and brittle the berries are run through machines which break the membrane and also remove the silver skin.

In the dry process, the pulp is not removed by water, but the whole berry is allowed to become very dry. Pulp, membrane and skin are removed together, as told above.

When all the chaff and other refuse have been removed, the beans go to a separator, which separates the beans of different sizes. They are then packed in bags, and are carried by mules, men or boat to the coffee market. There they are again sorted, and beans from different plantations are often mixed to make a desired blend. The coffee grown on different kinds of land differs somewhat in flavor. Next the bags go to the great coffee merchants in different parts of the world, who sell some of this green, or unroasted, coffee without any further treatment. Sometimes they mix beans from different parts of the world in order to get a coffee of a particular flavor.

Our grandmothers always bought the kind of green coffee they liked, roasted it in a pan or in an oven, and then ground what would be needed for breakfast in a noisy little hand-mill. Perhaps you have seen such a coffee-mill in some old house. Even to-day some people who are very particular about the taste of their coffee still hold to this plan. They say that coffee loses some of its flavor if it is ground more than a few minutes before it is used.

The coffee is at length ready to use

More and more, however, the coffee which we find at the grocer's is ready for use in the home. The grayish green beans have already been roasted, and under the influence of heat have increased in size and become a rich golden brown. Roasting must be done very carefully or the coffee will be spoiled. Often the beans are ground after roasting and packed into air-tight cans or boxes of convenient size, ready for the kitchen.

Not all nations use the coffee bean. The leaves of the plant make a drink stronger in caffeine than that made from the beans. It is not very pleasant to the taste, but it is drunk in Sumatra. In some parts of the Orient coffee is prepared from the whole berry, pulp and all, which has been dried and roasted, or from the dried pulp alone. Others boil the green beans a long time to make a drink.

Coffee is prepared for drinking in several other ways in different countries and in different kitchens. Some people boil the ground coffee; others use some sort of pot or percolator, in which the coffee is not placed in the water, but the boiling water is allowed to drip through the ground coffee. Some people make coffee with a great deal of hot milk; others prefer to use cream, while still others do not like either. Some people do not even like sugar in coffee.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 2305.

BLOSSOM AND FRUIT OF THE COFFEE TREE

The fragrant white blossoms of the coffee tree are a beautiful sight when they appear among the green leaves. The flowers do not appear all at once, but several times in a year. The tree is an evergreen.

Here are the coffee berries six months after the blossoms. Each berry contains two beans with the flat sides together, surrounded by a thin membrane and sweetish yellow pulp. It looks like a plum.

At the first page of our story you may see how coffee is gathered. Here is a small drying-ground in Costa Rica. In the foreground are the tanks where the pulp is softened and loosened. On the upper part of the drying-ground beyond the berries have been placed in long heaps to drain, and below they have been spread out to dry.

Upper photos, Underwood & Underwood, New York.

COFFEE ON THE WAY TO THE WAREHOUSE

The coffee beans are now almost dry, and the men are pushing all of them into a pile for the night. In the morning they may be spread again, but it is possible that they may be placed in bags and started on their way to the warehouse. Part of the open space in the background has been cleared, and the coffee is in the bags on the truck. Below we see the dried coffee starting to the warehouse.

© Underwood & Underwood, New York.

These rude carts are about to carry the dried berries to the coffee warehouses. Notice the clumsy solid wheels and the patient oxen yoked to the carts. Behind is coffee enough to fill hundreds of bags more. In most of the coffee country roads are bad, and only strong vehicles can stand the strain.

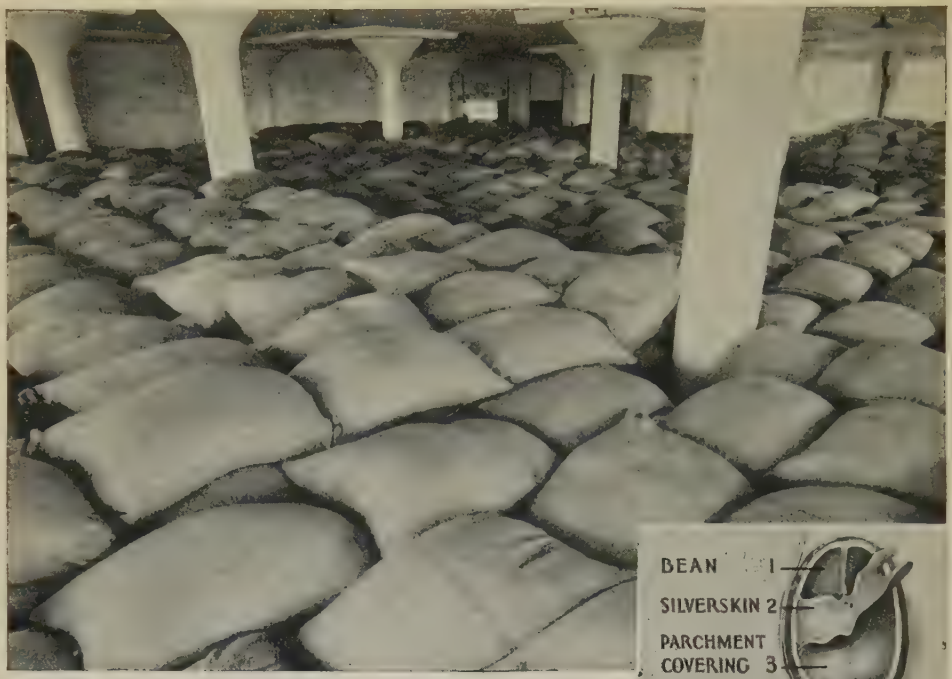
IN A GREAT COFFEE WAREHOUSE

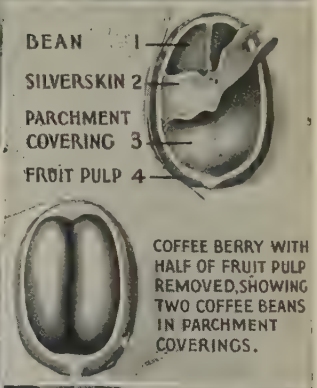
These are some of the machines in a great coffee-cleaning plant in Brazil. They separate the coffee beans from the "silver-skin" and the shreds of pulp which adhere, and also divide them according to size. On the whole very little machinery is used in the preparation of coffee for shipment. More machinery can be seen in the establishments which roast and grind the coffee in some of our large cities.

The coffee is almost ready to leave the land where it has been produced. In this great warehouse the correct weight is being placed in the bags, which are then sewn up. Next comes the ocean voyage, and it will soon be in the establishment of the great coffee merchants from which your grocer gets his supplies.

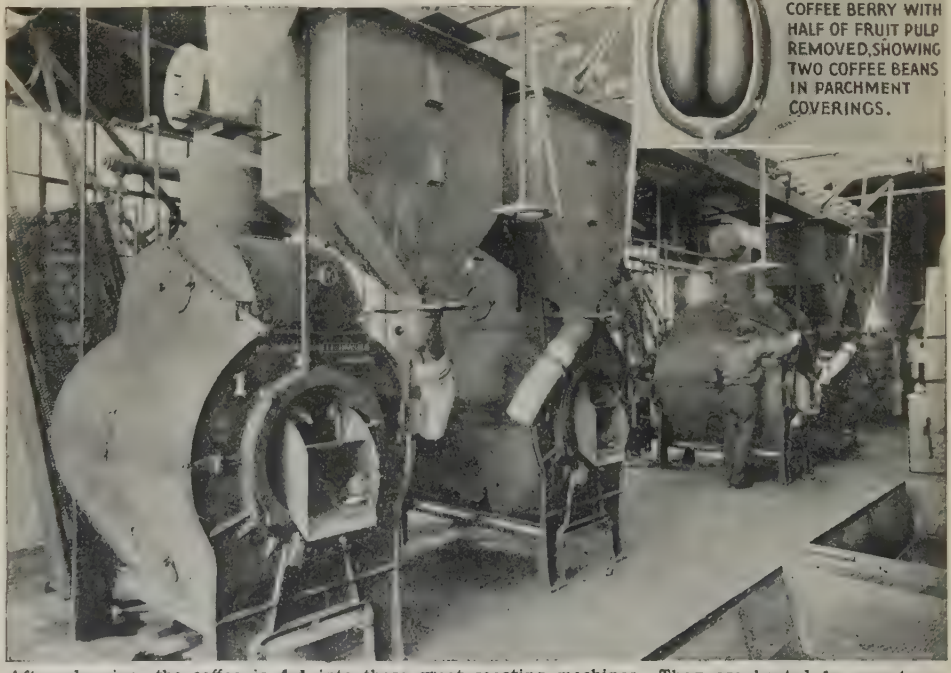
Except as otherwise noted, photos by courtesy of the Pan-American Union, Washington.

WHERE COFFEE IS PREPARED FOR USE




BEAN 1
SILVERSKIN 2
PARCHMENT COVERING 3
FRUIT PULP 4
COFFEE BERRY WITH HALF OF FRUIT PULP REMOVED, SHOWING TWO COFFEE BEANS IN PARCHMENT COVERINGS.

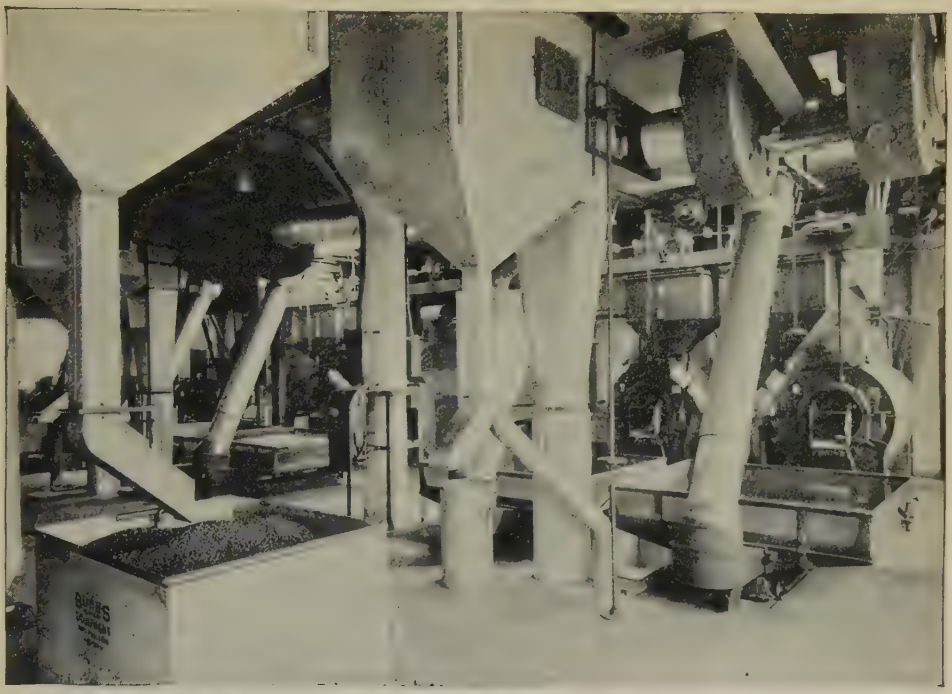
This coffee has come from South American countries to the warehouse of a great roasting establishment. Each of the sacks contains 132 pounds of green coffee. The smaller picture shows the different coats of the covering of the coffee grain.



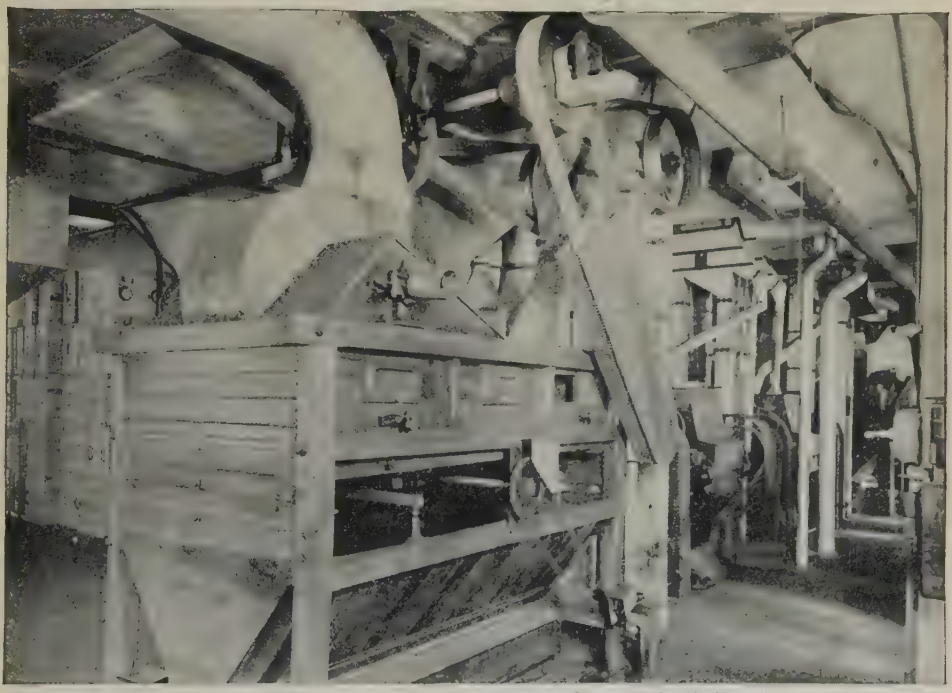
After cleaning, the coffee is fed into these great roasting machines. They are heated by gas to an internal temperature of 300°, and each machine roasts 500 pounds every twenty minutes. When the coffee is sufficiently roasted it is emptied into the shallow metal bins shown on the right.

Pictures of coffee-roasting by courtesy of Maxwell House Coffee Company.

THE COFFEE IS BLENDED AND GROUND

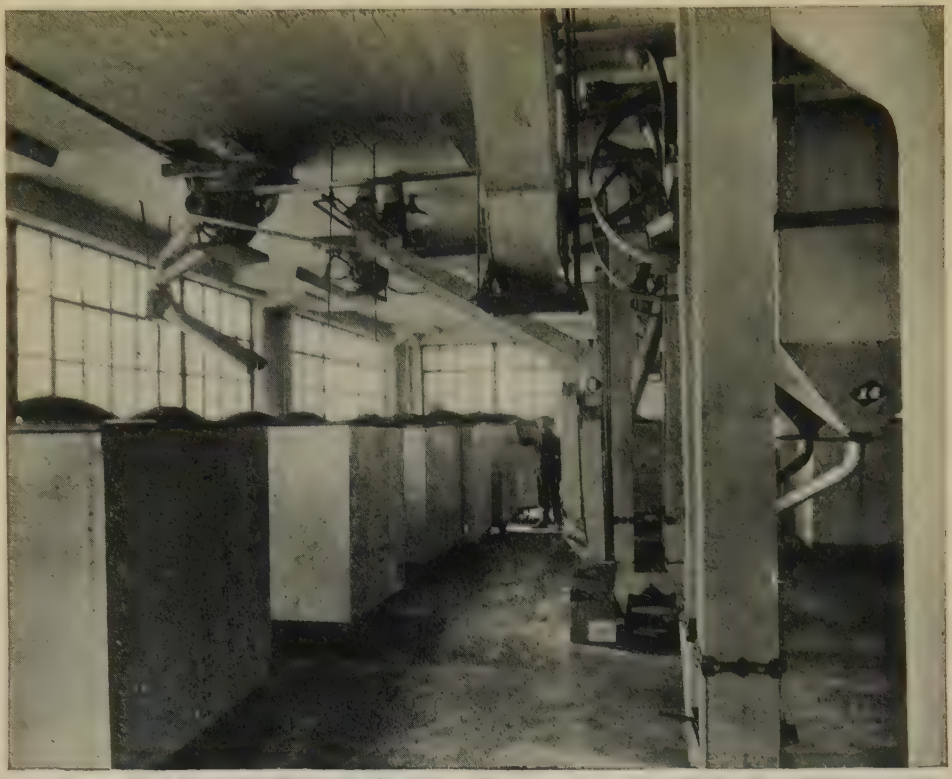


There is another view of the floor shown in the preceding picture, with the roasters in the background. After roasting, several kinds of coffee are mixed, or blended, in order to get the particular flavor desired. The coffee in bin on the left is ready either to be packed ground or in the whole bean.



If the coffee is to be ground it is sent to this department. The actual grinding is done by the mill machine to the right, which looks something like an upright piano. It can grind 2,000 pounds an hour. The wooden machine to the left is the purifier, which removes dust and any part of the husk which has not been removed before it reaches this point.

THE COFFEE IS ALMOST READY FOR USE



From the purifier shown on the page before, the coffee comes down through the pipes fastened to the ceiling into the great bins, each of which holds 1,500 pounds of ground coffee. It is now ready to be packed into the boxes or cans which you see on the grocer's shelves or in your own kitchen.

Ten thousand empty cans a day pass along each of these moving belts. At the end of the table at the right an ingenious machine called a rotary transfer weighs exactly one pound into each, and the girl puts on the top. At the third table the cans pass through the labeling machine, which labels and seals the cans. This machine has been removed from the first tables to allow us to take the pictures.

These pictures of a chop, a pod of peas, a glass of milk, a fish and a loaf show the value of these foods to the body. The parts marked 1 are water; 2 and 3 are carbohydrates and fats, which give the body energy and warmth; and 4 is protein, which rebuilds the body as it wears out.

FOOD AND ITS USES

CONTINUED FROM 2086

WE have seen that muscles are the furnaces where fuel is turned into work, and the ordinary name for muscle-fuel is food. By far the greater part of the food we consume is for the use of the muscles, including the heart and the muscles of breathing, as well as the muscles of locomotion and of the arms.

We have already learned something about the machinery in our bodies which takes in food and changes its useful parts so that they can enter the blood and be carried by it to every part of the body. Here we must go on to find what food is made of, and how we may be guided in our choice of what we eat.

As the body is a furnace and a machine, making power or work out of fuel, it must be supplied with something that will burn, and with enough of it. Wood, coal, charcoal, we find, are useless for the purpose. Carbon dioxid would not do, for that is fully burned up already. But one of the cheapest compounds of carbon is starch, and we find that starch is a fuel that the body can use.

Knowing that animals depend on plants, and plants on animals, we should expect starch to be useful when we know that every green leaf everywhere is making starch whenever light falls on it. We know how much starch we require every day, and so it is possible to say how much foliage must be at work every day for every human being, not to mention the lower animals. One square yard of leaves will produce about fifteen grains of starch in an hour. If you and I are to get all the fuel we need to-morrow, each of us requires to have 500 square yards of leaf working for an hour, or 100 square yards working for five hours. That is just an average. The exact figure would vary with the intensity of the sunlight falling on the leaves, the amount of work we did in the day, the size of our bodies, and so on. But it is well that we should think of ourselves as dependent on a multitude of green leaves somewhere which are turning the energy of sunlight into a form that we can use.

If we take starch outside the body and heat it in the air to the temperature of our blood, we do not find that it burns. Yet it burns within the body, and for that reason it is a fuel. We find that the body has within itself the power of causing things to burn under conditions of temperature, and so on, in which they would not burn outside the body. This is done by means of chemical substances called ferments, which exist in the blood and in every living cell in the body. They act upon the food in a way not fully understood, and prepare it so that it will burn at low temperatures.

The starch, then, is the chief fuel for our muscles, but we need other kinds of food besides those that are simply fuel. We must learn about these other kinds of food, but we have purposely begun with the question of fuel-foods because by far the greater part of the whole bulk of our food is required as fuel. Also we know more about the uses of food as fuel than we do about its other uses. Let us consider, then, the other kinds of food. The things that our bodies receive daily from the outside world are: air, water, light, salts, fuel-food and proteins. We will take them one by one.

We do not think of air as a food, yet any proper idea of what is meant by food must certainly include air, or, rather, oxygen. It is constantly being used up in our bodies and new supplies are always needed. It is possible to be *hungry* for this very valuable food. In some kinds of illness where sufficient oxygen can get into the blood only with difficulty, it is terrible to watch the unhappy person's "air-hunger." People are very likely nowadays to be particular about their food. It is a pity they cannot learn to be more particular about the quality and purity of their air-food, or of that on which they condemn others to live.

OUR LIVES MUST BE LIVED IN RUNNING WATER

The second thing our bodies receive every day from without is water. We do not often think of this as a food, but there we are wrong. By far the greater part of our bodies consists of water, and it is a notable thing, as true of an oak or a microbe as of ourselves, that for life there must be a ceaseless circulation of water.

Not merely is all life lived in water, but it is all lived in *running* water. No matter what kind of living creature we examine, we find that it is always giving off water, and unless this loss is supplied, it will soon cease to live. Few things in nature are more wonderful than the giving-off of water—a sort of perspiration—by the leaves of a plant. The roots drink the water from the soil and send it up to the leaves. The same process is going on in ourselves. On an average each one of us loses about six pounds of water every day of our lives by the action of the skin, the lungs and the kidneys. This means that the same amount of water must somehow be taken into the body every day; and thus there is no more necessary or important food than water.

We can learn a great deal from the foolish feats performed by fasting men. If a man can store up in his body anything he needs, he can do without fresh supplies of it for a time. We cannot store up oxygen to last us for more than a few minutes; but we can store up enough of the fuel kind of food, especially in the form of fat, to last quite a long time.

THE GREAT NECESSITY FOR WATER AND THE TERROR OF THIRST

A man may fast for sixty days, but that is because his body is, during all that time, using up the fat it has stored. But no man can store up water in his body, and so the fasting man always has to be allowed as much of this food as he pleases, just as he has to be allowed oxygen. Not even he is an exception to the universal law of all living matter, that it must have an unfailing supply of water.

This helps us to understand how it is that thirst is so terrible. Living creatures suffering from thirst will drink the most horrible things if there is no other way in which they can get water. We understand also why madness follows upon lack of water after a very short time, as we know in the case of shipwrecked sailors. Children live very quickly, so to speak, for they are naturally very active, and unlike grown-up people, they grow fast. They therefore need a frequent supply of water and suffer severely if it is not forthcoming. There are few things more cruel than to deprive a child of water or to expect it to learn its lessons well when it is thirsty.

THE POWER OF LIGHT AND SALT IN KEEPING US ALIVE

Another of the things that enter our bodies is light. Under this we may include, not only the visible light that strikes the eyes and the skin, but all kinds of invisible radiation from the sun and from the atoms of the air, which also strike and enter our bodies. These rays are only another form of energy; and we know that nothing is ever lost. Something must happen to them, and the fact that they enter the body just as surely as air, water or bread does, should not be forgotten. Up to the present, however, students of the body have studied this subject very little.

The case of salts proves to us at once that a thing may be a food even though it supplies no power to the body, not being burnable food, and even though it does not make tissues. Certain salts are absolutely necessary for life, and as they pass away from the body, the supply needs to be constantly renewed. We do not yet know nearly all their uses in the body, but we know some.

THE USES OF SALT AND THE PART IT PLAYS IN OUR LIFE

Many kinds of salts are necessary, though there is only one kind—common salt, or sodium chlorid—that we commonly add to our food; the other kinds are sufficiently supplied by their natural presence in food. We need lime salts, for instance, and there is actually more lime in milk than in limewater. Vegetables and fruits are of value very largely because of the salts they contain. Yet when we cook a cabbage we dissolve into the water the most valuable part of it—the salts it contains—and then throw the water away! Meat also contains a great deal of salt. But of all our foodstuffs fruit is the best, so far as the salts are concerned.

We look upon common salt as a thing to flavor food with, like mustard and pepper, but it is really a necessity of life. Not only does it play a necessary part in the blood and the tissues, but it is the source of one of the important products of the stomach, without which the digestion of our food would be difficult or impossible. If we remember that common salt is sodium chlorid we shall understand at once that it is a source of the hydrochloric acid which is poured into the stomach some twenty minutes or half an hour after every meal we eat.

THE THREE FOODS THAT MAKE UP THE CHIEF PART OF OUR DIET

If the body of an animal or a human being is burned, we find that there is always left an ash; and this ash consists of the salts that were in the body and cannot be burned. Important among them would be the salts of lime, which give strength to the bones and the teeth. If a bone is placed in an acid and the salts are melted away, the bone becomes quite soft and could be tied into a knot. So these salts are specially important as part of the food of babies and children who are making their bones and teeth. Salts of iron, too, are necessary for the blood, and it is easy to prove that there is a rich and constant supply of salts of iron in milk.

Now we come back again to the burnable foods which make up the bulk of our diet. They are of three kinds and no more—carbohydrates, fats and proteins. There is another class of substances which we must have if we are to be healthy, though we need only very small quantities. They are called *vitamins*, and we shall tell you of them in due time. Look in the index for the word.

Carbohydrates is the name given to compounds containing carbon combined with hydrogen and oxygen, such as the starch we have already mentioned; and proteins are the important compounds—containing carbon, hydrogen, oxygen, nitrogen and sulphur—that are found in all animals and vegetables. Carbohydrates and fats are pure fuels and nothing else; they are burned in the body, making heat and power.

Most of the fat we eat is of animal origin, such as the fat of meat, the fatty part of the yolk of an egg, and the fat of milk, cream and butter. It seems to matter nothing at all to the body whether its fuel is supplied as fat, sugar or starch, but perhaps sugar and starch have this advantage over fat, that they are more easily digested, besides being cheaper.

FOOD THAT BURNS AWAY OUR BODIES AND FOOD THAT REBUILDS THEM

For immediate result, and for simplicity of digestion, sugar is undoubtedly the best fuel-food. That is why children, who are so active and are specially in need of heat-producing foods, are naturally so fond of sugar and sweet things. If a child is always allowed as much sugar as it wishes, it is not so likely to make itself ill with eating too many sweets, as children do who have been unwisely starved of sugar.

Now we may leave the carbohydrates and fats, remembering that, while they must take a second rank as foods, because it is possible to live without them, yet they are exceedingly useful and valuable fuels, and probably to take more of them than we really need is as harmful as to take more than we need of proteins.

Proteins are the last class of foods that we need, and there is something special about them which raises them above all other foods in importance. We have described the body as a sort of engine

which needs fuel, and it is a living engine, burning and being destroyed from day to day. If it is to go on living it must be supplied with food which will make good its wear and tear. The only food which will do this is protein.

Every living creature requires a supply of proteins to make good its wear and tear; but only one kind of living creature, those that have chlorophyl, can make protein for themselves. All others must have ready-made protein supplied.

However richly a man was supplied with water, salts, starch, sugar and fat, he could not live without proteins. But we should clearly understand that the protein is required, not as fuel, for sugar and starch are better fuels, but as a means of repairing the body waste. Protein can be used as a fuel if necessary, so that it is possible to live without fats or carbohydrates. Very many people take far too much protein food, especially in the form of meat. They take it simply because they like it, but they do not know the consequences. If sugar and starch and fat are taken in excess, they can be stored up as fat; protein cannot be stored in the body.

Of course, we ought to know about how much of these various things are required in our food every day. What we need varies very much according to many circumstances. In the first place, it is certain that some people are more economical with their food than others: they can get out of a small diet as much work as other people get out of half as much again.

How the weight of food a man eats depends upon his work

These are natural differences which cannot be explained. The size of the body affects its needs. The Japanese have small bodies, and as a race are able to make a little food go a long way.

Climate and clothing also affect the amount of food we need. In warm air we lose heat less rapidly and so require much less fuel. Our appetites are naturally lessened in hot weather. In very cold climates large quantities of heat-producing food are needed. Thus, the Eskimo lives largely on blubber, which is fat. Similarly, other things being equal, the more clothes we wear the less food we need.

Muscular work greatly affects the quantity of food we need. The appetite of men doing really hard muscular work is very great. It has to be, if sufficient fuel is to be supplied to the muscular engines. Mental work scarcely affects the amount of food needed.

In all these cases it is the quantity of the heat foods and work foods—fat and carbohydrates—that should vary. The need for protein does not vary so much. An average diet for a man would be about 6 pounds of water, 1 ounce of salts, 15 ounces of sugar and starch, 3 ounces of fat; and of protein, probably 3 ounces or a little more is abundant. The quantities of foods must be increased for severe labor, and very much lessened if a person is going to stay in bed.

Why a boy may require more food than a man

Of course, the figures vary in proportion to the size of the individual; but a small man requires far less food than a boy of the same weight. Children need a quantity of food quite out of proportion to their weight, for while adults merely have to *maintain* their bodies, children are *making* their bodies. Children therefore require, not merely a large supply of food in proportion to their weight, but a specially large proportion of protein, for protein alone will make living tissue.

Another special need for children is lime, for bones and teeth; and so we should give children plenty of foods that are rich in lime, such as milk and eggs and oatmeal. Since the body is built up in childhood, it is particularly necessary that a child should be well fed. Too little food, or too much food, or the wrong food in the early years of life may ruin the physique of a child. In some of the countries of Europe after the World War, lack of milk and of good food had very serious consequences for the young. Thousands of infants had rickets and developed permanent deformities; older children ceased to grow, so that at twelve they had the stature commonly reached at nine.

But even where good food is to be had, children are very often fed in a foolish and harmful way, and suffer for it in later life. Foolish parents feed their children on tea and buns instead of on milk and cereals, and give their children ornamental and indigestible pastry instead of wholesome bread and butter. Unwise indulgence of this kind tends to spoil the children's health as well as their character.

THE NEXT STORY OF OUR OWN LIFE IS ON PAGE 2323.

A pioneer's log cabin in the backwoods.

TWO AMERICAN PIONEERS

CONTINUED FROM 2134

THE pioneers of an army are the men who go before the main body to prepare a camp, dig trenches, or bridge rivers. So we can easily see how the word came to be used as a name for men who strike out on a new path, making a way for others to follow.

When we speak of the pioneers in the history of North America we mean particularly those men who left the older settlements and struck out into the forest, across rivers and mountains, plains and deserts, to make new homes in the wilderness. They were brave, hardy men, filled with great courage. Sometimes they left the older settlements to make room for other members of their families. Sometimes on a hunting expedition they wandered into a more than usually fertile or beautiful spot, of which they made haste to tell their friends. A few of them, like Cooper's Pathfinder, grew to love the quiet and loneliness of the woods. The sound of the wind in the trees and the song of the river were more to them than the voices of men, and they fled at the approach of civilization. Some of them were men to whom any kind of settled life was hateful. Others set out in search of gold, like the miners of California, or, nearer our own time, of Alaska. Where they went others followed, and we owe it to the pioneers that the vast prairies of the West, over which the buffalo roamed, have become a granary for millions, and the busy hum of cities is heard where once the howl of the wolf broke the silence. Many of the picturesque band of early pioneers are nameless to us now. Others' names will be handed down through history. Perhaps the best known of all is Daniel Boone.

Throughout Daniel Boone's long life the frontier was his home, and from his early childhood to his old age his days were full of adventure. It is strange to us now to think of the Schuylkill Valley as being on the frontier, but when he was born there, in 1734, not fifty years before the Declaration of Independence, it was just on the edge of civilization. He was born in a log cabin, and until late in his life he did not live in a less primitive dwelling.

It is always interesting to know something about the family of a noted man. Fortunately in the case of Daniel Boone we know who his people were and where they came from. Some years before the time our story begins a Devonshire weaver came to settle in the Quaker colony of Pennsylvania,

bringing with him his wife and a large family of boys and girls. Squire Boone, one of these boys, married Sarah Morgan, a Welsh Quakeress, and Daniel Boone was one of their sons. Both father and mother taught their children self-dependence, self-control, great patience and loyalty.

THE DIFFICULTIES OF LIFE ON THE FRONTIER

There were few schools in the country in those days, and not until the boy was fourteen did he get a chance to learn to read and write. Then his brother's marriage gave the boy a sister-in-law who gladly taught him all she knew—reading, writing and a little arithmetic. But though he was able to gain little knowledge from books, he learned many things from nature. He knew well the trees and plants in the forest, and was familiar with the haunts and habits of the wild things that made the woods their home.

About five or six miles away from the clearing Daniel's father owned some good pasture land to which the cows were sent to graze every summer. There the boy's mother took him every year from the time that he was ten years old, and there they stayed until the cold weather forced them to go home again. He had to keep the cattle from straying away through the day, and in the evening to drive them back to the log inclosure round the cabin, where he helped his mother to fasten them up for the night, safe from wild beasts and thieving Indians.

THE INDIANS IN PENNSYLVANIA GENERALLY FRIENDLY

For themselves they had no fear of the Indians, who were generally friendly to the Pennsylvanians. From his infancy Daniel was familiar with the silent red men who came to trade their furs for the cloth and blankets that his father wove, or stood to watch the sparks that flew from the anvil in his blacksmith shop. Or perhaps two or three of them would come on a cold winter's night to ask for shelter from the storm, and wrapping themselves in their deerskins, would lie down to sleep on the cabin floor. He soon learned to imitate them as they glided through the forest, and it was in these early days that he gained the knowledge of their ways, which helped him out of many a difficulty in later years.

In spite of hard work he had time for play, and it was during his summer days in the woods that he laid the foundation for his fame as a hunter. At first his only weapon was a sapling torn up by the roots and trimmed down until it was just such a weapon as the staff which David used to kill the lion and the bear. His father was very proud of his skill in bringing down game by flinging this light club, and when the boy was twelve years old gave him a rifle of his own. With this he soon became an unerring marksman and a provider of game for the family.

THE BOONE FAMILY NEXT MOVES TO NORTH CAROLINA

When he was about sixteen the family left Pennsylvania and traveled down through the Shenandoah Valley into North Carolina. It was a long journey for a large family to take, with their horses, cattle, implements and household goods, but they traveled slowly, and Daniel had plenty of time to go on long hunts and explore the country through which they passed. At length they reached their destination, and settled down at Blue Lick in the Yadkin Valley.

These "licks," of which we read so much, were interesting places. In many parts of our country there are salt springs, and from time immemorial these springs were haunted by wild animals which came to lick the salt left by the water as it flowed away. They kept the ground around the spring licked bare, and so the place was called a "lick."

YOUNG BOONE GOES TO FIGHT AGAINST THE INDIANS

For the next three years Daniel lived at home, helping his father and brothers in the blacksmith shop in the winter, and in the summer going off on long hunting trips. But when he was twenty-one war broke out with the French and Indians. The war, which is called the French and Indian, or the Seven Years', War, was a struggle between the French and British for the possession of the country west of the mountains. The French built forts in territory which was claimed by Virginia, and under their leadership the hostile Indians became very daring. In 1756 General Braddock with a small army was sent from England to drive back the intruding Frenchmen and teach their Indian allies a lesson. The expedition fell into an ambush, and although Braddock and his men fought bravely, they were defeated, and he himself was killed. Daniel Boone was with the army.

This rather crude picture is taken from an old drawing representing Daniel Boone and his friends rescuing his daughter and two companions from a party of Indians. The three girls were on the Kentucky River, near the Fort at Boonesborough, when their canoe was carried away by the current, and the Indians, who were hiding, caught them and carried them off.

This picture shows the ruins of Daniel Boone's cabin at Femme Osage, in what is now Missouri. When Boone left Virginia in 1799 to find a place where he would have "elbow room," as he called it, he went to Louisiana, which had been transferred by France to Spain at the end of the French and Indian War. It became part of the United States by the Louisiana Purchase.

YOUNG BOONE BEGINS TO EXPLORE THE WILDERNESS

He was married shortly after this to Rebecca Bryan, the daughter of a near neighbor, and settled down to a life of hunting, trapping, blacksmithing and farming. But though he lived for many years in the little log house that he built, his days were not peaceful. Once the Indian wars had begun, they did not cease until after Canada was taken from the French in 1763, and at one time there was so much danger that Daniel thought it best to take his wife and little ones to Virginia for a while.

But he soon came back, and we know that he was present at some of the battles, and once he went away down into Tennessee—it is thought on a scouting expedition. Up to a few years ago, a tree stood on the banks of Boone Creek, in Tennessee, on which was cut an inscription reading:

D. Boon
cilled a BAR
on this tree
year
1760.

After peace came he devoted more and more time to hunting. Very soon he began to think of changing his abode, for there were now many families in the valley, and it is said that he liked his nearest neighbors to be so far away that he could not see their chimney smoke as it curled in the breeze. In 1765 he set out on horseback with seven other men to find his way to Florida. They had a difficult journey through the swamps, and once nearly died of hunger, for the hunting was very poor.

THE "DARK AND BLOODY GROUND" CALLED KENTUCKY

On his return he turned his thoughts westward to the land beyond the mountains—Kentucky, the "dark and bloody ground" of the Indians, of which he had heard many wonderful tales. He made an attempt to find it in 1767, and with one companion actually spent the winter there without knowing that he had reached it.

But it was not until 1769 that he set out on the expedition that made him one of the founders of the state. This time he and his companions penetrated into the country. They climbed up over the Blue Ridge Mountains, the Stone and Iron Mountains, through Moccasin Gap of Clinch Mountain, through Powell's Valley, up a hunter's trail through Cumberland Gap until they struck the "Warrior's Path," beaten by the feet of generations of Indian war parties, and so down into the forests of Kentucky.

MONTHS IN THE WOODS WITHOUT A COMPANION

Daniel did not leave Kentucky for two years, and twice was left alone for months, without even a dog as companion. He wandered all over the country, exploring it in every direction, noting its beauties, its well-watered plains and valleys, and storing up in his active mind knowledge that was of great value to the settlers who followed him into this fertile region. His brother Squire, who had been his companion during the year, came back in December, and they spent another winter in the woods. But this time they fell in with another party of hunters who met them in a curious way. One evening when these men were making camp they heard what in that place was a most extraordinary noise. Motioning his companions to be silent, the leader crept cautiously forward and presently came on Daniel Boone, lying flat on his back and happily singing at the top of his voice as he waited for his brother.

Boone was delighted with the Kentucky country, and in 1773 persuaded a number of families to join in attempting to make a settlement there. But one night, when they were on the way, his eldest son and some companions were surprised and killed by Indians, and overcome with sorrow and fright, the little party decided not to go on.

BOONE SERVES IN LORD DUNMORE'S WAR

A new war now broke out with the Indians, who had been greatly angered by the treatment they had received from the white men. Boone did good service in this war, which is known in history as Lord Dunmore's War, and received great praise for his work. During this war he was sent to warn some scattered parties of their danger, and traveled through woods which were alive with Indians.

The Indians were soon subdued, and when peace came the settlement of Kentucky was seriously begun. The new effort was made, on a much larger scale than before, by the Transylvania Company, with Colonel Richard Henderson at its head and Daniel Boone for one of the

A GREAT PIONEER IN HIS OLD AGE

Daniel Boone is here represented on a hunting expedition in his old age. Up to the end of his long life he made long hunting trips, sometimes with only one companion. It is said that on one of these trips he traveled across the continent and he saw the wonders of the region that is now Yellowstone Park.

leaders. Early in 1775 the first party of settlers reached Big Lick on the Kentucky, by the path which has since been marked out by the Daughters of the Revolution. They began to build a fort, and Boone turned surveyor, laid out the site of a town, later called Boonesborough, and planned the fort. Outside this fort there was a great elm tree, and under its shade the first assembly ever held in Kentucky met to make laws to govern the little community.

THE GROWTH OF KENTUCKY MUCH HINDERED BY WAR

In spite of drawbacks the little colony grew steadily. Boone and a number of

After Daniel Boone moved over into that part of Louisiana which is now the state of Missouri, the Spanish governor made him a magistrate. While he was in office he held his court under this tree, now called the "Judgment Tree."

the other settlers brought their wives and families, and prosperity seemed in sight. But the Revolution broke out, and the Indians commenced to raid the weak settlements. The first warning that the Boonesborough settlers had of their peril was the kidnaping of Boone's daughter Jemima and her two friends, Betsey and Fanny Calloway. The three girls were paddling on the Kentucky one Sunday afternoon when their canoe was carried by the current to the opposite bank, and they were captured by five Indians who had been watching the fort from the bushes. Colonel Calloway, the father of Betsey and Fanny, followed in hot pursuit with a party of mounted men. Boone, leading a party on foot, followed the trail and, guided by the scraps of clothing and bruised twigs which the brave girls contrived to leave in the path, caught up with them and rescued them.

BOONE ONCE MADE A CAPTIVE BY INDIANS

The war times were gloomy days for Kentucky. The fort was attacked, and once Boone was wounded and barely escaped with his life. Another time, when he had gone into camp at Blue Lick to make salt, he was captured by a war party of Indians who were on their way to attack Boonesborough. He knew that the fort was not ready for defense, and in desperation promised the Indians that if they would put off the attack until spring, he would persuade his companions to surrender to them. The other members of his party listened to his persuasions, and these brave men, to save their families and friends, voluntarily went into what they knew would be a hard and bitter captivity. All through the winter they were dragged about the country from place to place, going even as far as Detroit.

In the spring, when the Indians were gathering for the attack on the settlements, Boone managed to escape and, without food, traveled steadily on toward the fort. He found it unprepared for an attack, but set the people vigorously to work. This was in June, 1778. However, the Indians did not reach the fort until August, when they appeared in large force, and the siege of Boonesborough is famous in the annals of Kentucky. At times the settlers almost despaired; but at last, to their joy, the noise of shouting and fighting suddenly quieted down, and the Indians silently disappeared in the forest.

For years the settlers in Kentucky endured hardships and suffered many things from the Indians, even after the War for Independence came to an end. In spite of sorrow and hardships, however, the country continued to fill up, and Boone was in great demand as a surveyor. His knowledge of the Indians and his calm bravery and patience made him a tower of strength. He was made lieutenant of his county, town trustee, and was sent as representative to the legislature at Richmond.

He does not appear to have been a good business man, and in spite of the fact that

he was a surveyor and must have known the regulations, he failed to file his own land claims. As a consequence, new settlers registered claims against his property. As he had failed to comply with the law, the courts could do nothing for him, and he found himself without an acre of ground in his beloved Kentucky. Sadly disappointed, he left it and went back to what is now West Virginia, where he lived in the little village of Point Pleasant for a number of years. He was held in great esteem by the people, who again sent him to the assembly at Richmond, though he cannot be said to have been a brilliant success as a legislator.

After the final defeat of the Indians by General Anthony Wayne, more people began to arrive in Kanawha Valley, and again Boone felt that he must move so that he might have "elbow room," as he expressed it. Some members of his family had gone to Missouri—then under Spanish rule—and there he followed them, about 1799, with his wife and family and all his possessions.

He was very happy for a few years in Missouri. He received a large tract of land from the government, had plenty of room, good hunting, and was made magistrate of his district, an office in which he was very popular. But after the Louisiana Purchase, Missouri came under the government of the United States, and we have a repetition of the old story.

In 1813 he was greatly saddened by the loss of his wife. After her death he left the little house in which they had lived for years, and for the remainder of his life was tenderly cared for by his sons. He lived until 1820, always happy and active, going off sometimes on a hunting trip, sometimes working a little on the farm.

At the time of his death there was in session in St. Louis a convention to draft a constitution for the state of Missouri, which had applied for admission to the Union. Upon hearing the news of his death the delegates to the convention adjourned for the day as a token of the respect in which he was held.

The people of Kentucky felt that some honor should be shown to Boone, and a monument was built to his memory at Frankfort, the capital city. He was not the first man to explore the region, nor even the first to settle in it, but they realized that he was the best type of pioneer, and that in honoring him they honored what was greatest in the men who had taken their lives in their hands and gone out into the wilderness to build a nation.

This is the kind of home which the pioneers built on the edge of the wilderness. The men have felled trees, in clearing the ground for cultivation, and are dragging them into a heap to burn them. During his life Boone must have assisted many times at such a scene as this. From an old print.

JAMES ROBERTSON OF TENNESSEE

WHILE Daniel Boone was helping to build the state of Kentucky the same work was being done in Tennessee by James Robertson. Robertson, who was a few years younger than Boone, was born in Virginia. We know little of his early years, except that while he was only a child his family moved to North Carolina. Of course he learned to hunt and shoot, and knew all the trees and plants, and the birds and animals of the woods, how they lived and where they made their homes. No boy of pioneer days who did not learn these things was counted of much use to his community. When he was about twenty-six Robertson married.

About two years after his marriage he decided to go in search of a place where he could make a new settlement. With nothing but his horse and his rifle for company, he crossed the mountains and found himself in the lovely Watauga Valley, where there were already a few settlers as adventurous as himself. He stayed long enough to prove the fertility of the land by growing a field of corn, and then recrossed the mountains to bring his family back to build the new home that he planned.

On the long journey back through the mountains he lost his way and his horse, and if he had not been rescued by hunters, he would have lost his life; but he reached home safely, and was so full of enthusiasm that sixteen other families determined to join him when he set out in the spring.

A LONG JOURNEY OVER THE MOUNTAINS TO A NEW HOME

Many of us know the discomforts of moving just from one comfortable house to another, even with the aid of skilled packers who take every care of our treasured belongings. But can you imagine the moving of those seventeen families who set out to make the Watauga settlement? Early in the spring everything that could be carried on the backs of horses was packed; the things that could not be taken were sold or given to neighbors; the door of the old home was closed, and each family set out for the meeting-place. There the sadness felt at leaving the old home was forgotten in the feeling of adventure. With the leader at the head of the column, the women and children on horseback, the men trudging at the horses' heads and keeping careful watch, and the boys ranging the forest on either side, or driving the cattle that they brought with them, the little party went forward with high hopes. At night they camped, and you can imagine the delicious feeling of safe fear with which a little boy went to sleep under the starlight in his father's strong arms, or a little girl nestled close beside her mother, near the fire, sure that any prowling Indians or bears or wolves would fall before the aim of the men on watch.

They arrived safely at the Watauga, and the men soon built the log cabins that were to be their homes, and gradually made the simple furniture that had to fill their needs in the early years of the settlement. Trees were cut down to clear the fields, and the land was tilled. The next year John Sevier, also a native of Virginia, joined the settlement, and he and Robertson became the leaders of the little community.

THE LITTLE SETTLEMENT FORMS A GOVERNMENT

The Watauga Valley, in which the new settlement was made, was far from the older settlements and the towns where the courts of law were held. So the men met in convention and decided to form a government of their own. They drew up a written constitution known as the "Articles of the Watauga Association" and elected a little assembly of thirteen representatives to govern them. From among the representatives five were chosen, and these men formed a court to try all cases of wrongdoing. Unfortunately the paper is lost and we do not know the exact wording.

That same year Robertson and another man made a treaty with the Cherokee Indians who lived near by. To celebrate the treaty, sports were held, to which the Indians were invited, and a feast was made. But some bad men who were prowling around in the woods killed an Indian, and the whole party left the settlement vowing vengeance upon it. Not a moment was to be lost. Leaving Sevier and the other men to build a fort as a place of refuge, Robertson set out alone to make peace with the Indians. Although he knew that they might torture him to death, he followed them through the forest, and when he came up with them, apologized for the action of the wrongdoer

and won them over completely by his fearlessness and courtesy.

ANOTHER MOVE THROUGH THE LONELY WILDERNESS

Robertson prospered in Watauga, but about eight years after he settled there he determined to go farther afield. This time he made up his mind that before the moving began there should be some houses for the people to move into. So, in the spring he and eight other men climbed the Cumberland Mountains and went down the other side into the land that lies between the Cumberland and the Tennessee. They traveled as far as French Lick, which they decided was a good place for a settlement, and there they planted a large field of corn and built log cabins. When the work was done, three men stayed to guard the crop and the houses, and the others went back to Watauga to show the way to the men and women who were to make the new settlement.

Most of the younger men of Robertson's party followed him through the mountains to the Cumberland Valley. It was a toilsome road, however. It was thought that the river would be an easier way for the women and children to take, and with a few men they went round by boat. On your map you can easily follow the adventurous voyage taken in the winter of 1780 by so many boys and girls, some of them perhaps the ancestors of some of our readers. The party, we are told, left Cloud Creek, on February 27, 1780, under command of John Donelson, a friend of Robertson. They floated down the Tennessee until they reached the Ohio, rowed and paddled up the Ohio to the Cumberland, and up the Cumberland to Big Salt Lick, where Robertson met them. Two months had been spent on the way, and much of the time they had been in peril from Indians, and toward the end they were sometimes hungry. This was a very roundabout way, as you can see by the map in your geography, for the Tennessee River flows almost twice across the state, and even then the journey was not over.

No sooner were the people settled down in fixed habitations than Robertson and Colonel Richard Henderson, who had been associated with Boone, helped to organize a government. Representatives were chosen by each of the little villages in the settlement, and the representatives met in Nashborough, the central fort, which was built where Nashville now stands. Robertson was made chairman of the court and colonel of the militia, and seems to have been looked upon as the natural leader of the whole community. He was one of those men who seem born to lead others, not because of birth or education, but because of bravery, good judgment and high character.

HARD DAYS OF INDIAN WARFARE ON THE FRONTIER

Before long the Indians attacked the new settlement, and the settlers were kept constantly on the alert. Some families deserted their clearings and went back to their old homes. Others wanted to go, but Robertson persuaded them that to face the dangers was the braver part, and heartened by his strength, they stayed and were able to fight off their attackers. As winter came on, the powder and bullets began to run short, and the dauntless Robertson went alone through the woods to Kentucky, where he got a supply and brought it back just in time to beat off two attacks made by the Indians.

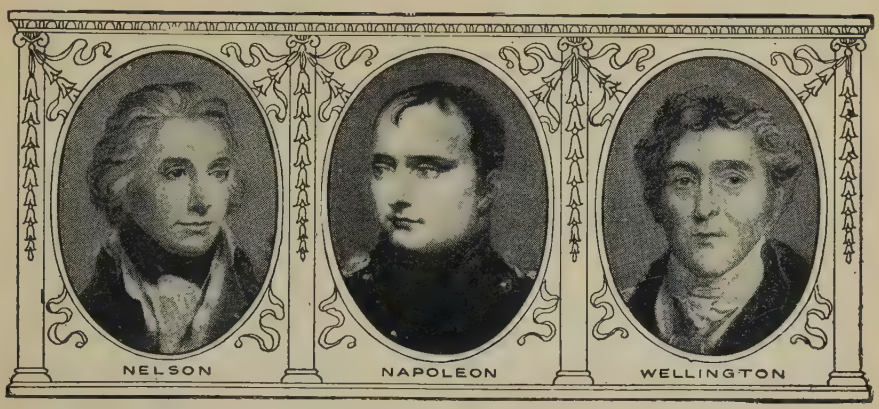
Robertson suffered much hardship during the years of Indian warfare which came after the Revolution. One of his sons was killed, and he himself was wounded and almost captured. But the great-hearted man was a tower of strength to the people of the Cumberland region. We find him promising that a road should be built and seeing that it should be done, organizing armed forces and leading an expedition against the Indians, and persuading new settlers to come into the district, for he knew that the only way to quiet the Indians was to overawe them by filling the country with white people. Many strong men and women did come in. By degrees the country filled up with comfortable farms, and, except on the border, the warfare died out.

All this time the country which is now Tennessee had been part of North Carolina. In 1791, however, North Carolina ceded it to the nation, and it was made the territory of Tennessee. Robertson was put in command of the militia in the western part of the territory, and a few years after the state of Tennessee was admitted to the Union he was made a state senator. During the War of 1812 he did much to prevent the Indians from joining the British. He died in 1814 and his memory is honored to the present day.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 2327.

The battle of Arcola was one of the most brilliant of Napoleon's victories. With three Austrian armies approaching him, he made a daring night march and attacked them on swampy ground where cavalry could not charge. After three days' fighting, the French were victorious. Napoleon nearly lost his life here. Seizing a flag, he rushed onto a bridge to rally his men and was pushed into the river.

After the defeat of Napoleon's army at Waterloo was assured, and the Prussians, in hot pursuit of the French, had turned their retreat into a rout, the Duke of Wellington and the Prussian general, Blücher, met on the battlefield and congratulated one another upon the victory that had been won, as shown in this picture by Daniel Maclise. The brunt of the battle had been borne by the British, and Blücher's arrival put an end to any hope that Napoleon might have had of rallying his forces.



NAPOLEON AND HIS CONQUERORS

CONTINUED FROM 2103

THERE was born in a little room in Ajaccio, on the island of Corsica, on August 15, 1769, Napoleon, the second surviving son of Charles Bonaparte and Marie Letizia Bonaparte, whose maiden name was Ramolino. It was from his mother that Napoleon inherited the touch of granite in his character.

The Bonapartes were of Italian origin, 240 years before Napoleon, but they had become so Corsican that they were neither Italian nor French in sentiment until the French gave Corsica freedom as a part of France. Then they became whole-heartedly French, though the family character retained many Italian traits.

Young Napoleon left Corsica at the age of nine, to be educated in France as a soldier. At sixteen he was a sub-lieutenant of artillery, poor and not very popular, for his appearance did not recommend him to his officer comrades. He was small, slight, and had a dark-skinned Italian appearance. But his comrades, however critical they might feel of his appearance, could not deny that he was a diligent student of his profession. Military science, history, geography, travel, and the lives of men of action made up the chief substance of his reading.

Seven years passed between the time when this young officer began his training and the time when he was given responsible work. During that period he saw the outbreak of the Revolution and approved of it; he also approved of the wild folly of the Reign of Terror in Paris and elsewhere. But he formed the opinion that the mob ought never to be allowed to rule, even momentarily, and so, though he was a Republican, he held a firm belief that order should be kept by the state at any cost.

After the execution by the Revolutionists of the king and queen of France, England joined in the war against the French Republic, and her fleet occupied Toulon harbor on behalf of the Royalists, who held the town. But from the landward side the Republicans began a siege of the city. The only hope of driving the English fleet out of the harbor was by artillery fire, and the command of the artillery was given to young Bonaparte. So skillful were his plans of attack that the English ships had to withdraw, Toulon was recaptured, and at the age of twenty-four Napoleon became a brigadier-general.

Thus the young soldier's first experience of war was against the Eng-

lish, who, for twenty out of the twenty-two years that divided his start at Toulon from his final overthrow at Waterloo, were to be in arms against his country.

Bonaparte had now become a man from whom great deeds were expected. France needed defenders badly. The central Government in Paris was weak; many people were dissatisfied; and the French armies on the frontiers, holding back the enemies who wished to crush the Republic, were being hard pressed, though the war minister, Carnot, was proving a tower of strength.

How the Cruelties of the Revolution Broke the Strength of France

The most vital point for France was the north of Italy, then held to a large extent by Austria, her most dangerous Continental enemy. So the young general sketched out a plan by which the Austrians were to be driven from Italy. The fierce cruelties of the Revolution had caused France to be honeycombed with jealousy and distrust, in the army as elsewhere, and though Napoleon was as clever in politics as in war, he could not save himself from being arrested on suspicion of treachery after he had been appointed to command the artillery of the French army marching to invade Italy. It needed the influence of Carnot to secure his release.

Such success as was gained in Italy was due to the plans of Napoleon, but he felt that he must have a free hand, and so aspired to the chief command of the French army on that frontier. He would not accept lesser commands that would put him at the mercy of the political parties now cutting off each other's heads as one or other gained the mastery in Paris.

At last the state of Paris grew so dangerous that another revolution seemed at hand. Though General Bonaparte had now been struck off the list of fighting French officers, and was thinking of offering his services to Turkey, he was given the command of the troops in Paris with the task of preserving order.

Napoleon Puts On a General's Hat and Seems Two Feet Taller

When the rising came, so well did he manage his artillery that with comparatively little loss of life the rebellion against the Government was suppressed, and the people of Paris were able to judge the cleverness of the young general who seemed to perform brilliantly whatever needed doing. Thus early Napoleon stood apart as a leader of men.

He had an immediate reward. When he was five months short of twenty-seven he was appointed, on the motion of Carnot, commander-in-chief of the French army in Italy, and thus reached the full height of his immediate ambition. He had won the chance for which he had been working. Moreau, the chief commander on the Rhine front, was eight years older. The best general on the Italian front, Masséna, was eleven years older than the new commander, and Augereau, who was to serve with Napoleon through nearly twenty years of carnage, was twelve years older. None of these generals knew Napoleon when, mean in stature and haggard in face, he appeared among them. But, as Masséna remarked of him, "the moment after he had put on his general's hat he seemed to have grown two feet."

Two days after his appointment to the command in Italy he married Josephine Beauharnais, a widow six years older than himself.

Napoleon was now in a position that would allow him to disclose his real motives if he were successful; and he *was* successful with a swiftness that electrified France and Europe.

How the Austrians Were Turned Out of Northern Italy

The Austrians were in possession of Lombardy in northern Italy, with Milan as their Italian capital and the great fortress of Mantua as their base. As allies, they had the Piedmontese Italians, with Turin as their capital. Napoleon's whole army was less than two-thirds of the united armies of his opponents.

Striking at the junction of the two enemy armies, he rolled up the Austrian centre, then swung round and defeated the Piedmontese. Turning again with the bulk of his army, he next defeated the Austrians and headed their retreat away from the Piedmontese. He was now free to deal separately with the Piedmontese, whom he twice more defeated, whereupon their king asked for an armistice.

There was only one enemy left. The beaten Austrians were followed up swiftly; battle after battle was won; and two months after Napoleon had received his appointment as commander-in-chief in Italy he made his entry into Milan,

amid applauding crowds who believed him when he said he was bringing them freedom from the Austrians.

France was in ecstasies of delight. Instead of being crushed by her enemies, six of whom were hemming her in by land and sea, she was turning the tables on them on the landward side. What should this wonderful general do next? The French Government, at that time called the Directory, sent him word that he must turn southward to Rome and deal out punishment for the opposition which the Church had offered to the French Revolution.

THE GENERAL WHO WOULD STAND NO NONSENSE FROM THE POLITICIANS

Not the least notice was taken of these orders by Napoleon. "Do you think," he asked, "that I triumph in Italy to make the greatness of the lawyers of the Directory?" So he proceeded to use his victories as he thought best, and won a peace according to his own liking. In the meantime he sent to Paris General Augereau, who he knew would not put up with interference from the politicians.

He followed up the Austrians, defeated them repeatedly in the neighborhood of Mantua, forced the surrender of that fortress, crossed the Austrian Alps, and arrived within one hundred miles of Vienna. Then Austria accepted his terms of peace.

These terms were the surrender of Belgium to France, the extension of the French frontier to the Rhine, and the founding of an Italian Republic in the north of Italy. In return Austria received from Napoleon Venice, which before had been independent and was not his to give away. At the same time he made friendly proposals to the pope to relieve the religious difficulties that were hampering France. He also poured wealth and treasures from Italy into France.

NAPOLEON DECIDES TO STRIKE A DEADLY BLOW AT ENGLAND IN THE EAST

Here, then, at the end of his first campaign, we see the true Napoleon. He had found France a nation struggling desperately to maintain the freedom she had won through her blood-stained Revolution; and he blinded her eyes by saying he was carrying that freedom beyond the Alps into Italy, and beyond the Rhine, to make free nations there. But really he was making France an aggressive nation, for wherever he carried the French eagles France became the mistress, and he the master of the conquered lands, though he might give each region the name of a republic. The so-called republics he made in the name of freedom had to pay handsomely into his treasury and provide him with soldiers. His devotion to freedom was illustrated by his betrayal of free Venice to Austria, the worst representative of feudal tyranny in Europe.

His marvelous campaign against the Austrians caused the coalition of nations against France to break up. Only England remained unbeaten. What would France do for Napoleon? She made him commander of the army called "the Army of England," that is, the army raised to fight England.

Where could he best strike a deadly blow at England while she held command of the seas? He decided that her vulnerable point was India, where she had now become the predominant power. "Europe," he said to his secretary, "is too small a field. Great fame can be won only in the East." And so toward the East and India he set his face, beginning his enterprise with the landing of an army in Egypt, to hold it as a halfway house, while he proposed to dig a canal across the Isthmus of Suez and thus join the waters of the Mediterranean with the Red Sea.

THE THREE MEN WHO FACED THE COLOSSUS ASTRIDE THE NARROW WORLD

Here we see the fateful converging of the lives of the four greatest men of action of that age—the demigod Napoleon and three Englishmen who, from this time forward, by their deeds while they lived and by their influence after they were dead, finally overthrew him.

Those three Englishmen were William Pitt, the organizer of opposition to the man who had begun to "bestride the narrow world like a Colossus"; Lord Nelson, the guardian of Britain's safety behind her girdling seas; and the Duke of Wellington, who year by year wore down the dangerous France Napoleon was building up, and finally overthrew the man who "left a name at which the world grew pale."

As early as 1793 Pitt had engineered the coalition of Great Britain, Russia, Austria, Spain and Piedmont against France, but, as we have seen, it was broken up by Napoleon's Italian victories. Still Pitt went on with his schemes, continuing the war at sea,

shattering the French naval strength, seizing France's West Indian islands and the colonial possessions of any other state, such as Holland, that sided with France as the French frontier was extended. It was Pitt's mind, using England's money, that steadfastly continued the struggle, with or without friends, always scheming to form fresh combinations hostile to France as circumstances would allow. No wonder that Napoleon saw England as the power that barred his way to the mastery of the world.

Out of the constant warfare on the sea emerged the heroic figure of Nelson, one of the greatest captains that ever sailed the seas on fighting bent. The son of a Norfolk clergyman, Horatio Nelson went to sea at the age of twelve, a year before Napoleon was born. He, too, was small and slight, but, unlike Napoleon, he was delicate.

THE DELICATE BOY WHO WAS NOT AFRAID TO FIGHT A BEAR

No boy seemed less suited to a sailor's life, but in him burned the fire of dauntless bravery. From the first his mind was fixed on being a hero, and he knew no fear.

The first proof of it came when he was a little middy serving in the Arctic seas. Sighting a polar bear on the ice, he went after it with a musket, fired at it and wounded it; whereupon the bear, fiercest of fighting animals when hurt, turned to chase him. Anybody else would have "made tracks" to save his life, but not so young Nelson. He clubbed his musket, which there was not time to reload, and advanced to meet the bear. Luckily for him and for England, a shot from one of his comrades laid the bear low just as it was clawing for him and he was clouting it with his musket.

That encounter was a forecast of Nelson's seafaring life. Whatever the odds, he advanced to the attack, and not only did he know no fear, but he had the power of inspiring others with his own bravery.

But Nelson was far more than fearless: he became a master of every form of seamanship. At the age of twenty he was captain of a ship.

THE BATTLES IN WHICH NELSON LOST HIS RIGHT EYE AND HIS RIGHT ARM

Whenever active service was possible there Nelson was found, and always in the most dangerous place. While Napoleon was winning his first military honors at the siege of Toulon, Nelson was engaged in the blockading of the port outside; and after the withdrawal of the English ships from the harbor he commanded a landing party in Corsica, and lost the sight of his right eye from a shower of gravel flung up by a cannon shot. Later he lost his right arm, shattered by a grapeshot when he was trying, on a dark night, to cut out a Spanish treasure ship in the harbor of Santa Cruz de Tenerife.

Five months earlier another exploit won for him the rank of rear-admiral. This exploit was performed in the course of the battle off Cape St. Vincent, where Sir John Jervis defeated the Spanish fleet. Nelson, who was in command of the Captain, detected a manœuvre which might have allowed the Spaniards to escape. He placed his ship across the line of the Spanish advance without orders from his admiral, and so took the fire of all the foremost ships for half an hour. His ship was disabled, but she had barred the way till the other British ships came up and won a great victory. When they returned from the pursuit they found that Nelson had managed to drift his battered ship alongside a Spanish ship, boarding and capturing her, and then passing from her to capture a second Spanish ship, so that his own shattered ship was in safe possession of two prizes.

HOW TWO GREAT FLEETS CAME TOGETHER UNAWARES

As Pitt's coalition against France had broken up, and the Dutch, Spanish and French fleets were all against England, while the ports of Italy were closed to her, the British fleet had been withdrawn from the Mediterranean, so that Napoleon was free to transport his army to Egypt. But Pitt knew that an army was gathering round Toulon and felt that it must be watched. In consultation with Sir John Jervis, who was now Lord St. Vincent, he selected Nelson, just made a rear-admiral, to re-enter the Mediterranean with a British fleet, and checkmate, as far as possible, any plan Napoleon might have formed.

Napoleon left Toulon for Egypt on May 19, 1798, with 13 battleships, 12 frigates, and 200 transports, and Nelson's fleet of 14 battleships assembled and started in pursuit, June 7. Nelson had

no small ships to act as scouts and could only guess where Napoleon had gone, but he decided for Egypt. Napoleon had delayed in order to capture Malta, and in the night of June 22 the fleets were close to each other unawares. Nelson reached Egypt first, and, finding that Napoleon was not there, he scouted back along the coast of Asia Minor. On reaching Alexandria Napoleon heard that Nelson was searching for him, so he hastily landed his army, leaving 13 battleships anchored in a line in the Aboukir roadstead, near the mouth of the Nile, and there they were on the evening of August 1, when Nelson returned.

Instantly he attacked; half his ships passed inshore of the French line and half outside, with the French between the two fires. The battle lasted till midnight, and the whole French fleet was sunk or taken except two battleships and two frigates which escaped in the night but were captured later. Nelson himself received a severe wound across the forehead during the engagement.

Nelson's name now resounded through Europe. He was made an English baron and an Italian duke. Never had there been such a complete victory at sea. It left Napoleon's army stranded in Egypt, without support and unable to return to France. It enabled Pitt to form another coalition against France in which Russia, Austria, Portugal, Naples and Turkey joined Great Britain. The fruits of Napoleon's great Italian campaign were lost, while France at home was thrown into a state of confusion that threatened reaction and disaster.

NAPOLEON'S DRAMATIC RETURN HOME AFTER HIS DEFEAT ON THE NILE

Once more it seemed as if France was overthrown, and as if Europe, united, might wipe out the effects of the French Revolution. Her only hope was in Napoleon. He had lost her Mediterranean fleet, but she was accustomed to defeat by England at sea, and as Napoleon had conquered Egypt and annihilated a Turkish army sent against him, some glory still shone around him. In October, 1799, he arrived in France, having quietly slipped away from Egypt by sea. He was received with exultation. When he asked what had been done with his conquests during his absence, France had no answer to give. They were lost. Masséna, bravely but with difficulty, was holding back the enemy who had advanced to the borders of France in the south. Moreau was doing the same in the north.

The return of this remarkable man altered everything. The Directory was swept away, and a new constitution was formed which the country approved of, in January, 1800. It placed three Consuls at the head of the French Government, Napoleon being the First Consul and the other two men of no importance, so that he possessed all the real power.

Then, crossing the Alps by the St. Bernard Pass, Napoleon fell on the Austrians, and in the battle of Marengo defeated them. Moreau, to the north, won the decisive battle of Hohenlinden. This led to the collapse of all France's enemies and the regaining of the territories won in Napoleon's first Italian campaign.

The great aim of Napoleon's life now was to isolate and ruin England by closing all the Continent against her. Aided by the tsar of Russia, he tried to form against her a northern coalition of Russia, Prussia, Sweden and Denmark.

HOW NELSON DISOBEYED THE ORDERS OF AN ADMIRAL AND WON A VICTORY

The most dangerous element was the fleet of Denmark, and England met the danger by bombarding Copenhagen and seizing the Danish fleet. Here, again, Nelson was responsible for the victory, though to win he was obliged to disobey the orders issued to him by a stupid admiral who had been placed in command because he was older than Nelson.

The battle of Copenhagen and the death of the mad tsar Paul broke up the northern coalition, and then, for a short time, there was peace. This Peace of Amiens, however, was very insecure, as France had gained terms which were certain not to be kept, for they amounted to a defeat for England.

Now Napoleon mounted rapidly toward the summit of his ambition. In May, 1802, France voted that he should be Consul for life. In May, 1804, she voted that he should be Emperor of the French. Was it not enough to turn the head of one who from the first had been working steadily for his own glory?

THE WILLINGNESS OF THE PEOPLE THAT WAS BEHIND NAPOLEON

Yet the French were not without reason in taking full advantage of Na-

poleon's military genius. They had risen from a state of national misery into comparative prosperity by the Revolution which gave the peasants rights in the soil they tilled, and they saw in Napoleon the defender of those newly won rights against the autocratic governments of other lands.

It should never be forgotten that Napoleon undoubtedly reigned in France by the will of her people, again and again renewed; and he showed during the first four or five years of the nineteenth century that he had as great capacities for good government in times of peace as he had aggressive power in war.

The work he did at home in France was great and lasting. He brought order to a nation that was confused by changes made by weaker men. He gave France a code of laws that has been a model for many nations, and established a system of government that remains unchanged in many respects to this day. He reorganized education, was tolerant of different forms of religion, promoted scientific study, and opened careers, in the army and elsewhere, to every Frenchman, rich or poor. Most steadying of all, he accepted firmly the position left by the Revolution in the country districts, so that the peasantry looked upon him as the defender of their fields and vineyards.

If only he had been able to stay his hand from war and live at peace after the Treaty of Amiens in 1802, Napoleon would have been by far the greatest man in history. But he was not able to remain quiet. He meant to overthrow England, if possible, directly by invading her, or indirectly by conquering all her friends and then starving her into submission by destroying her trade.

First came his attempt at invasion. On the French shore he collected at Boulogne a great army with which he felt sure he could march triumphantly through England and capture London—if only he could get the army across the Channel. So sure was he of victory that he had medals cut beforehand in France celebrating the victory, and saying, in the inscription on them, that they had been cast in London!

How they frightened the little English children in those days

All England was in a state of excitement. The most frequent way of keeping English children quiet in those days was to say "Boney is coming!" All except the bravest of grown-up people trembled, while they prepared to defend their native land. But Nelson, with his fleet, was keeping watch, and he was as great a terror to the French and Spaniards afloat as Napoleon was to the nations of Europe ashore.

Napoleon ordered the French fleet to put to sea, but it would not, and finally he withdrew his army from the coast in order to attack Austria and Russia, who, influenced by Pitt, had made another alliance.

Even the friends of Napoleon in England—for he still had friends there—began to see that he was engaged in the pursuit of personal glory when he formed northern Italy into a kingdom and crowned himself as its king. Advancing rapidly against Austria, he captured one of her armies at Ulm, and routed the combined Austrian and Russian armies at Austerlitz.

The great Pitt dies with a prayer for England on his lips

On the previous day when the Austrian disaster occurred at Ulm (October 21, 1805) the French and Spanish fleet of 33 ships of the line ventured to put out to sea, and were met off Cape Trafalgar by Nelson with 27 British ships of the line. Flying the signal, "England expects that every man will do his duty," Nelson at once attacked the larger fleet before him, and a great sea-fight followed. At its close 18 of the enemy ships were captured and the rest dispersed, but the heroic Nelson lay dead on the Victory, with the words, "Thank God I have done my duty," on his dying lips. He had utterly crushed the sea-power of his country's enemies, and left Napoleon with no hope of conquests except on land.

But the great Corsican's land conquests prospered more and more. When Pitt, six weeks after Trafalgar, heard of the great defeat at Austerlitz and the eclipse of his plans and hopes, he ordered the map of Europe at the British War Office to be rolled up. Ill at the time, he became completely disheartened, notwithstanding Trafalgar, and died with the despairing words, "My country! How I leave my country!" on his lips. But though the great statesman who had opposed Napoleon from the first and the sailor-hero who had saved England on the seas were dead, their spirits lived on in

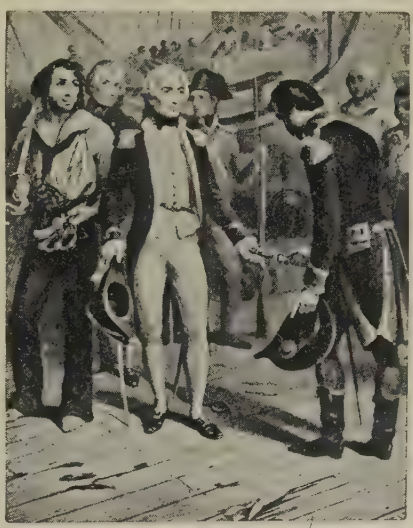
the men whom they had inspired, and England never again relaxed her efforts to save the world from the man whose definite aim it was to be a universal conqueror.

The one European country that had kept out of the strife was Prussia, and when Austria had again made peace, Napoleon forced war on Prussia, routed her armies in the two great battles of Jena and Auerstadt, fought on one day, and entered Berlin in triumph. Afterward, through dreadful carnage at Eylau and Friedland, he forced Russia into peace and close alliance.

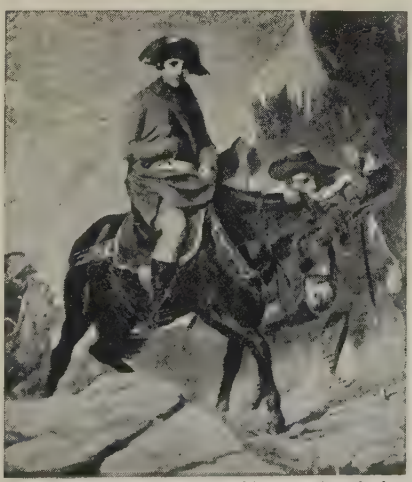
All Europe north of the Pyrenees was now at his feet, and everywhere trade with England was forbidden. This was the high-water mark of Napoleon's power. Again he had the opportunity of pausing; but still he went on. His brother Louis was made king of Holland, his brother Jerome king of Westphalia, his brother Joseph king of southern Italy, while he himself was king of northern Italy. Later, when Joseph was made king of Spain, Murat, Napoleon's brother-in-law, succeeded him as king of southern Italy. All southern Germany was in alliance with the French Empire. Only England was free.

To complete the ring of enemies of England Napoleon invaded Portugal to

Wellington on the field after Waterloo.



Nelson receives the Spanish officers' swords after St. Vincent.



Napoleon Crossing the Alps, painted by Paul Delaroche.

make her refuse to trade with England. He invaded Spain to put Joseph Bonaparte on its throne. This crossing of the Pyrenees was the fatal step that led to the conqueror's downfall, for here, in the Peninsula, he met his third great English opponent, who at last became his conqueror.

At the time when Napoleon began his widely planned attack on England by occupying Egypt he had found an ally in Tippoo, the sultan of Mysore, a turbulent Indian ruler. But Tippoo was attacked by the English, and defeated and slain in a battle in which a young English general, Sir Arthur Wellesley, who had been born in the same year as Napoleon, greatly distinguished himself. Later, when the French invasion of Portugal began, Wellesley was chosen to take command of an English army that went to the help of the Portuguese, and he swiftly defeated the French army. Had it not been that Wellesley was superseded by an older general after his second victory, he would have captured the whole of the French army in Portugal. As it was, he proved himself the general that England needed to oppose Napoleon on land as Nelson had opposed him on the sea.

Later, when the invasion of Spain developed, the English sent into Spain an army

commanded by Sir John Moore. Hitherto Napoleon had been fighting against emperors and kings: he had not been opposed to a whole people, except the English people. In Spain it was the people who resented the French invasion; and though the French could beat the Spaniards in pitched battles, the Spaniards harassed their armies incessantly by attacks on their lines of communication. No French straggler was safe.

At last the outlook for the French became so bad in Spain that Napoleon himself crossed the Pyrenees. His army was so great that the British, under Sir John Moore, were obliged to retreat to the coast, or be cut off and captured by overwhelming numbers. Seeing Napoleon's difficulties in Spain, the Austrians once more declared war against him in 1809, whereupon he returned from Spain and left the pursuit of

The funeral of Napoleon at St. Helena, by one who saw it.

Napoleon's body leaves St. Helena, by one who was there.

The state funeral of Napoleon in Paris.

The body arrives at the Invalides.

Napoleon's tomb at the Invalides.

Moore to Marshal Soult, who caught up with the British army as it was about to embark for England. The battle of Corunna followed, when the English faced about and drove back the pursuing French army under Soult. Sir John Moore was killed during the battle and buried by his men in the night before they embarked. The Spaniards erected a monument over his lonely grave.

The next time an army was sent to Spain to help the still unconquered Spaniards Wellesley was its commander, and he never left the field again until Napoleon was finally beaten.

When Napoleon reached Austria he defeated the Austrians in terrible battles at Essling and Wagram. After entering Vienna he again compelled them to make peace.

Napoleon now got rid of his wife Josephine, who had been devoted to him, and married

the young archduchess Marie Louise of Austria, thus hoping to raise himself socially into the circle of the hereditary European monarchs. He had made some inquiries respecting marriage with the sister of the tsar of Russia, and when these fell through, the tsar was offended. In 1812 Napoleon began an invasion of Russia, taking a huge army for the purpose.

But the best of his soldiers were in Spain, where Wellesley, who had now become Lord Wellington, was winning

The battle of Waterloo will always be known as one of the turning-points in the world's history. Here the power of Napoleon, the man who had changed the map of Europe, was forever broken. And whenever Waterloo is spoken of, Wellington, the victor of Waterloo, will also be remembered. Here we see the Iron Duke, as Wellington was called, years after the battle, surveying the field of his victory that saved Europe.

battle after battle against the best of Napoleon's generals—Masséna, Marmont, Victor and Soult—and driving back the French.

The campaign against Russia proved a disastrous failure. Though Napoleon won great battles there, and reached Moscow, the Russians burned the city so that it should not give him shelter, and at last, with the terrible winter cold freezing and starving his army, he had to retreat.

THE WORLD'S ADVENTURER GIVES UP HIS CROWN AND RETIRES TO AN ISLAND

As he retreated his enemies rose against him on all sides, the Prussians and other Germans, and Austrians and Swedes joining in, while Wellington forced the French to retreat through the Pyrenees and finally invaded the south of France, with Soult offering a desperate but unavailing resistance to the onward march of the British.

At last the policy of Pitt was triumphant. Napoleon's campaign for glory had not only frightened the kings of Europe but had roused the people of every country to unite. Though he fought to the last with skill and bravery, the day came—it was April 11, 1814—when the world's greatest adventurer was compelled to resign his crown and was sent into retirement as ruler of the little Isle of Elba in the Mediterranean. In France the brother of the beheaded king reigned for a little time in his stead.

For ten months Napoleon remained quiet in Elba, consoling himself with the thought "I shall always be a remarkable man." Then, showing for the last time that he never knew when to stop, he crossed quietly to France to appeal to his old army to make him once more Emperor of the French. Once more his spell over his soldiers worked. The army sent to apprehend him went over to his side.

How Napoleon Burst into France Again on His Way to Waterloo

The response of the army was wonderful. His journey from the coast to Paris was a triumph. But his enemies were not to be caught. The nearest of his opponents were the British and the Prussians, and their best meeting-place was Belgium. Into Belgium the British army went, under the command of Wellington, while the Prussians, under Marshal Blücher, lined up alongside them. Less than half Wellington's army were British; the rest were Germans and Belgians.

Napoleon's plan was to hold the English in check while he crushed the Prussians, and then to turn on the English and crush them. But Wellington and Blücher agreed that whichever of them should be forced to retreat, the other should fall back also, so that they should not be so divided as to be unable to help each other.

On June 16, 1815, Napoleon sprang on the Prussians at Ligny while more lightly attacking the English at Quatre Bras. The Prussians were driven back, while the English held their ground, but at night they, too, retreated, keeping touch with the Prussians, and next day Wellington took up his chosen ground at Waterloo to meet the attack he knew was coming. The two great generals, Napoleon and Wellington, whose armies had been fighting each other for six years, had never met. "Now I go to measure my strength with Wellington," said Napoleon.

The End of the Struggle Between Great Men and Great Nations

On June 18, a Sunday, the final fight began. Against the English line the whole force of the French—foot, horse and artillery—was flung hour after hour, and still the line held; there was not a yard's retreat. Five times Ney, the bravest of the brave, led the charges. Gradually, as the afternoon wore on, the Prussians began to arrive, rallied after their beating of two days before. Then Napoleon, knowing that the decisive hour had come, sent forward his Old Guard, whose motto was: "The Old Guard dies but never surrenders," and Wellington, knowing that the end was at hand, ordered the English to meet charge with charge. Napoleon himself should have been in that charge, but he was not there. He did not meet his conqueror in the field. He was only in the midst of his men as they were swept off the field, and he with them, as a fugitive.

As Wellington rode back over the battlefield that night, while the Prussians pressed on the pursuit, he murmured repeatedly to himself, "Thank God I have met him! Thank God I have met him!" It was the end of a mighty struggle between great men and great nations. A long and dramatic chapter of history was closed.

On arriving in Paris, three days after Waterloo, Napoleon still clung to the hope of rousing national feeling in his favor, but the temper of the people was now against him. On June 22 he abdicated in favor of his son, although this was a mere form, as his son was in Austria and not in the least likely to be brought back by the French. Then he was told he must leave Paris, and for four days he took refuge in Malmaison, the home of Josephine, where she had died shortly after his first abdication.

The Prussians, with orders to take him dead or alive, now advanced, and Napoleon retreated westward. He was hoping to sail for the United States, but could get no passports, and when he reached Rochefort he found that British cruisers cut off his hope of escape. Given only a day to leave France, he decided to cast himself upon the generosity of the British Government. Dictating a letter to the prince regent, then ruling for King George III, he compared himself to Themistocks seating himself at the hearth of his enemy. His friend and counselor, Las Cases, who accompanied him, made overtures to the captain of the M. S. Bellerophon. This captain carried him to Plymouth. The British Government decided to send him to St. Helena, a lonely island some five hundred miles off the coast of Africa, where he could have a certain freedom of movement without endangering the safety of the world at large. To St. Helena he proceeded. His title of emperor had now been forfeited, and he was treated officially as a general.

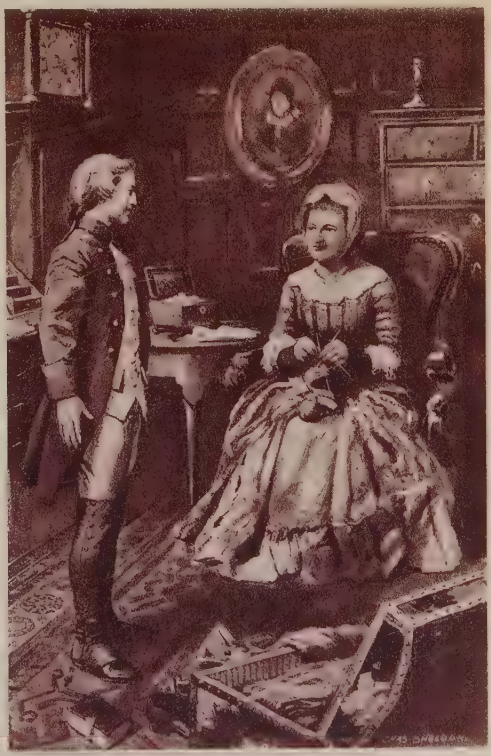
Arriving in St. Helena in October, he resided first at The Briars and later at Longwood, a residence specially prepared for him. His chief interest during his captivity was the dictation of his memoirs and the writing of essays on military and political subjects. He died in 1821.

THE NEXT STORY OF ALL COUNTRIES IS ON PAGE 2293.

NAPOLEON AND HIS CONQUERORS

NAPOLEON AS A BOY AT THE MILITARY SCHOOL AT BRIENNE, BY REALIER DUMAS

NELSON'S GOOD-BYE TO HIS GRANDMOTHER BEFORE GOING TO SEA, BY GEORGE W. JOY



PROUD YOUNG WELLINGTON SHOWS HIS MOTHER HIS NEW UNIFORM

TRAFALGAR—THE SHIPS OF NELSON'S FLEET

NELSON ON HIS FLAGSHIP THE VICTORY

WELLINGTON ON HIS MARCH FROM QUATRE BRAS TO WATERLOO. FROM THE PAINTING BY ERNEST CROFTS, R.A.

THE EVENING OF WATERLOO—NAPOLEON ON THE FIELD OF BATTLE, BY ERNEST CROFTS, R.A.

THE CAPTIVE NAPOLEON ON BOARD THE BELLEROPHON. FROM THE PAINTING BY W. Q. ORCHARDSON, R.A.

MEISSONIER'S PICTURE OF NAPOLEON AT THE HEAD OF HIS TROOPS

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A dolphin takes a leap.

THE WHALES AND THEIR COUSINS

CONTINUED FROM 2147

THE children of this generation can answer a question which challenged the wisdom of bygone ages: "What was the song the sirens sang?" It was, if anything, a huff and a puff, a snort and a grunt, which never charmed man to death. One would not have dared to make such an answer in the great days of Greece or Rome. But though the Greek civilization was perhaps greater than ours in some ways, the Greeks were not great in science.

To-day we know what those sirens were whose singing was supposed to lure mariners to destruction upon sea-washed rocks. They were the mermaids of whom our poets have sung.

Without doubt the sirens and the mermaids, with all their legends, were what we call sea-cows, plump manatees and dugongs, as innocent as they are ugly, and utterly unromantic. The old stories we read give them beauty of voice and form. We are told that they were half woman and half fish when they were not half woman and half bird. But they really were ordinary peaceful creatures with thick hides and bristly hair, browsing placidly through life in sea gardens and river sanctuaries. Of course they are mammals, like the seals and walruses, the tapir and the tiger. They are warm-blooded, breathe air, and suckle their young in the manner of all other mammals. It was this way of feeding their young which led to all the poetic errors. When suckling, the mother raises herself in an upright position, with her head well out of the water, and clasps her little one to her breast so that it may breathe while feeding. This attitude suggested a human creature in the sea to the old-time sailors. The idea stimulated the imagination of writers, and for two thousand years literature and folk-lore encouraged this romantic fiction.

The original Sirenia, as we call their group in natural history, were land animals. Long, long ago they went to live in the waters and fed and rested there. To-day they could not live ashore if they wanted to. They have great flat tails; the hind legs have vanished; and their forelegs are flippers. Hidden in them, however, are the bones of the five toes with which they once stalked dry land.

The Manatee, a lumbering animal ranging up to eight feet, is an ancient dweller in tropical American waters. It may be found in the sea, but its home is mainly in the rivers.

The old Spanish explorers saw this

huge unknown beast in the Amazon and other rivers. They were as horrified at its appearance as the first Englishmen who set foot in Tasmania and bolted at the sight of "gigantic tailed men leaping toward them"—the first meeting with kangaroos.

THE MANATEE WITH GRASPING POWER LIKE AN ELEPHANT'S TRUNK

Yet the manatee is more harmless than a sheep. Its teeth are not meant for combat. Indeed, its method of feeding is unique among mammals. The upper lip is divided into two bristly pads, with a grasping power like the trunk of an elephant or the tail of a spider monkey. The two halves of the lips open outward then come together to seize herbage and draw it into the mouth. The action is very much the same as the way a caterpillar uses its jaws when it dines on a cabbage leaf. But the manatee can use the edge of its flippers to push food into its mouth—as a frog does when a worm is large and unwilling.

The Dugong is about a foot longer than the manatee, and is a portly fellow six feet round. Its food is seaweed and marine grasses, and it frequents the shore of the Indian Ocean and is found from East Africa to Australia and around the Red Sea. The manatee can take to sea or river at will, but the dugong is restricted to salt water and dies in fresh. In habit it is sluggish and inoffensive.

Both manatee and dugong are likely to disappear entirely. Unfortunately for them, their hides can be made into leather and their blubber into oil. Their tameness and inactivity allow them to become easy prey to greedy men, so that these dodos of the mammal world will vanish like that hapless bird.

THE WHALE IS THE LARGEST ANIMAL IN THE WORLD

At the Natural History Museum of London the greatest wonder until 1914 was the skeleton, 84 feet long, of an ancient extinct diplodocus. But then a Sibbald's Whale came in, dwarfing everything, for it measured all but a hundred feet, and its weight, when alive, must have been over a hundred tons. And in the American Museum of Natural History in New York City is a life-size model of a Sulphur-bottom whale almost as long.

The skeleton of the whale shows that there are all the bones of five toes in each of the paddles, and hidden under the blubber are the bones of hind legs no longer used. The mighty tail is rudder and propeller in one, horizontal—not vertical, as a fish's tail. There is the strength of many horses in its stroke. It brings the whale to the surface like a volcanic island; it drives it down again like a colossal bomb. At one moment the whale is breathing at the surface at normal atmospheric pressure; very soon afterward it is hundreds of feet deep, bearing a pressure of many tons on every foot of its body.

We cannot do anything like this. Our inventions crumple like tinfoil under such a stress, and man would be crushed if he tried such depth with his own body. About twenty minutes seems the time a whale can remain submerged. At the end of that period up comes the leviathan to breathe.

SOME WHALES HAVE TEETH; OTHERS DO NOT

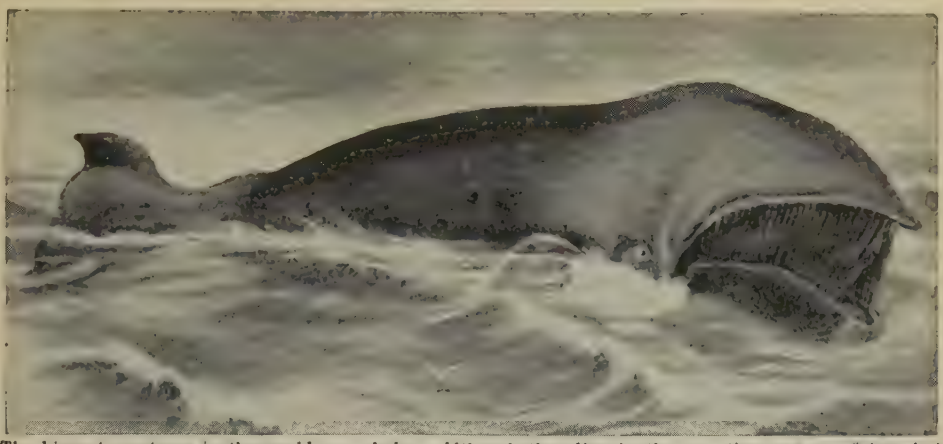
The Whalebone whales have two nostrils on top of the head, the Toothed whales only one; but the process of breathing is the same. Out comes the exhausted air, hot and steamy as it enters the atmosphere. Sometimes before it quite reaches the surface the animal begins to pour forth its pent-up breath, in which case water is blown up from the sea with the air, and "There she blows!" cries the lookout on the whaler.

THE GREAT WHALE WITH A MOUTH THAT OPENS LIKE A CAVERN

The most important of the whalebone whales is the Greenland, or Arctic Right Whale, as it is sometimes called. Its mouth is a maze. There are no teeth, but enormous plates of horn in the upper jaw, frayed at the edges as if they had been combed for use by some herculean tool. When the mouth is closed, the plates lie flat, toward the throat; when the mouth is open, the plates are raised so that they hang like descending curtains in the mouth.

Open-jawed the monster steams along, with water pouring into that vast living cavern. When the mouth closes, the water strains out at the sides; but all the little life-forms that swam in it are trapped in the baleen fringes, and fall down on the tongue to be swallowed. The throat of one of these giants is so small that a herring could not be swallowed! It is swarm upon swarm of

GIANT MONSTERS OF THE SEA



The biggest creatures in the world are whales. Although they live in the sea, they are not fishes, but animals. They feed their young on milk; they cannot breathe under water. This is a Baleen Whale, which has no teeth. Its enormous mouth is fitted with whalebone, with which it catches its food, as in a fishing-net. The whalebone in a whale's mouth may weigh 1½ tons, and is worth $10,000 a ton. The whale's oil is valuable.

This is a Cachalot, or Sperm Whale. It has about fifty teeth in the lower jaw, but none in the upper. At the back of its head are stored tons of oil, from which we get spermaceti for ointments and the best candles. We get ambergris from the cachalot, which is made into perfume worth from $10 to $30 an ounce. The male cachalot is about 75 feet long, and fights fiercely with other cachalots when the herds are being formed.

The great whales do not eat each other, but here is a cannibal whale. It is the Orca, or Killer. Several join together to kill the other whales. The killer is 20 feet long and has terrible teeth.

minute life—shrimps and pteropods—that makes the wheels of life go round in that incredible living factory.

This natural sieve may contain as many as 400 plates, weighing from a ton to a ton and a half, and worth in the market $10,000 and upward. The body of all the right whales is covered with a thick layer of fat called blubber, which is almost a non-conductor of heat. Therefore the whale can live in the icy seas. For this blubber, which yields oil, whales have been hunted in every part of the world.

The nearest kin of the Greenland Whale is the Black Whale, or Atlantic Right Whale, often known as the Nordcaper. Although we find it on our coasts from time to time, it is accustomed to deeper waters than ours, and there is a belief that a similar whale in the Far South is of the same species, and that the group parted ways long ago to become separated forever by thousands of miles of equatorial waters.

Smaller and more active than the Greenland, the black whale offers us a little mystery in the honeycombed bosses about the nose. These prove to be the sanctuary of swarms of a sea crustacean commonly known as whale-lice. It is believed that these parasites are really friends of the whale and keep it free from barnacles.

THE ENGAGING LITTLE FELLOW THAT WE CALL THE PIGMY

An engaging little fellow called the Pigmy Whale suggests by his title the hope of an aquarium pet, but whales are whales, and this one's length is from fifteen to twenty feet, half the length of a grim fighter, the Gray Whale, which produces its young and nurtures them with pathetic affection in the south before setting sail for the more northerly waters which will then be warmed by summer sun.

Humpbacks come next, whales forty-five feet long, and rising to breathe as a living flash, like a rocket in its ascent. Other whalebone whales are the Rorquals, or Fin-whales, which include the largest specimens of all. There are several species. The two largest are mentioned above.

It is believed from examination of specimens which have been caught that the giant Sibbald feeds chiefly on a sea shrimp. If that is so, then here is a wonderful testimony to the food value of shrimps, for the Sibbald is the largest creature that ever existed.

Some of the rorquals swallow shoals of sardines and sprats, and it may have been some of these against which the French Government declared war in 1921, all vessels in the French Navy being ordered to open fire on whales because, it was said, the animals were injuring the sardine fisheries. Suppose the whales had land forces and caught *us* eating sardines!

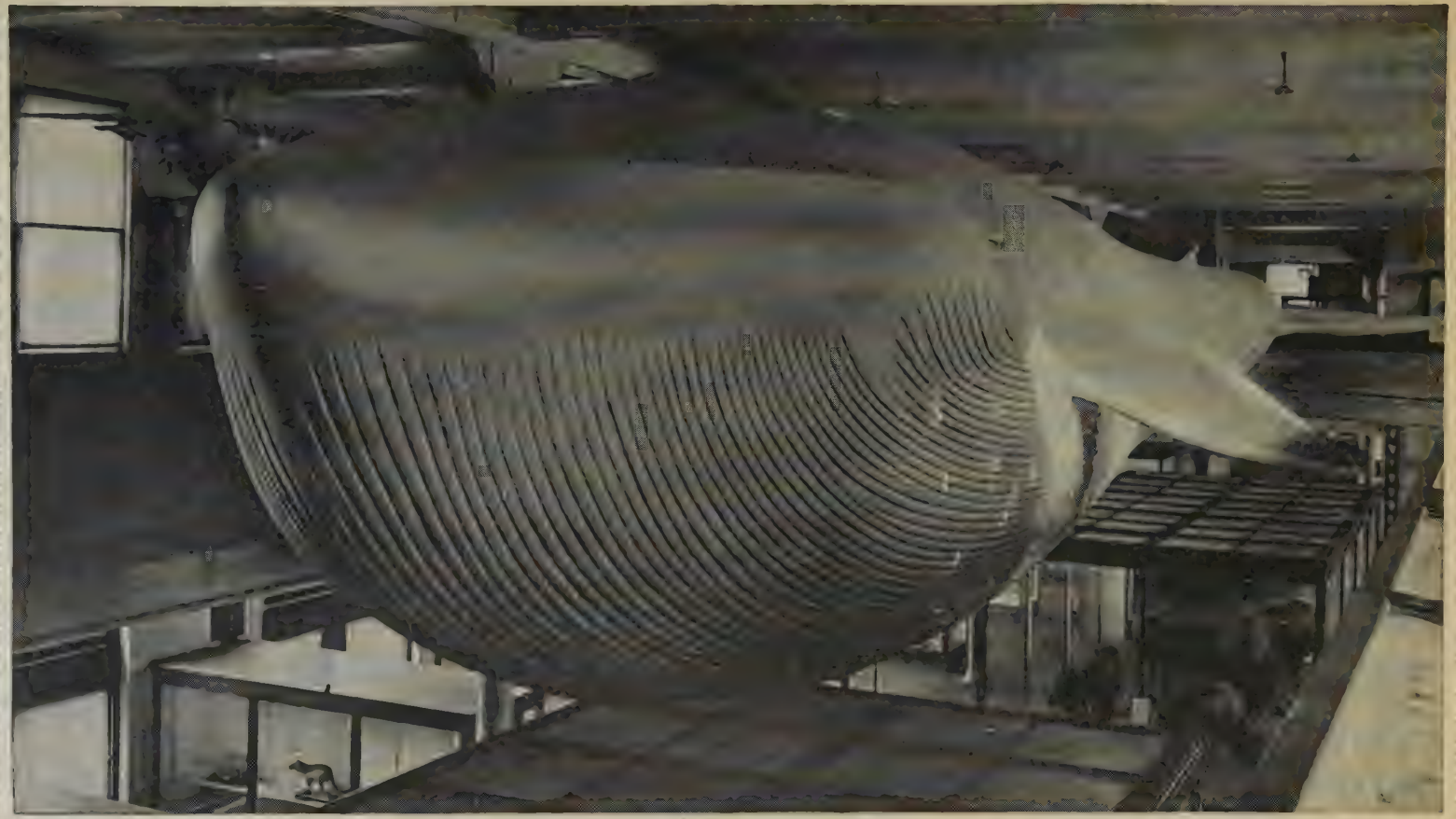
THE COMBAT IN THE SEA AT WHICH THE IMAGINATION REELS

Well, the Sperm Whales escape that form of persecution, for they keep to deeper seas in warmer latitudes, where the great sea squids are. They are fighters! It is true their teeth are confined to the lower jaw, but that does not matter; a Cachalot Whale does not follow our good nursery rule of masticating its food, but bolts it in masses. It has often been known to smash a whaleboat with its jaws. But then this 60-foot whale has a mouth which extends for a third of its body. There is no doubt as to one of this species having the capacity to swallow Jonah.

But it goes about seeking what it may devour, and though a shark or fish of equal size may be a relish, in common its diet is squid. Imagination reels at the combat between one of these 70-ton whales and a squid whose frightful tentacles, armed with claws and grim suckers, measure thirty and forty feet. A few have been reported.

The toothed whales yield the famous sperm oil, contained in enormous quantities in a cavity lying along the head. From the interior of its digestive organs is produced the strange substance called ambergris, which realizes many dollars an ounce for use in perfumes. This substance is, however, produced only by diseased individuals. One man found a mass of this substance weighing five hundred pounds, the product of a single whale. It is these properties which lead to the persecution of the animals. During the World War whales were hunted more vigorously than ever, for their oil was converted into nitroglycerine for explosives. Strange, is it not, that a monster roaming the deepest abysses of ocean should be slain with one man's explosive to form more explosives for men fighting on the other side of the world.

A MODEL OF A GREAT SULPHUR-BOTTOM WHALE



The Rorquals are the largest of all the whales and therefore are the largest animals in existence. This is an exact model of a great Sulphur-Bottom, so called from the color of its under-parts.

Photo, courtesy American Museum of Natural History.

THE CACHALOT WHALE IS A GRIM FIGHTER

But sometimes the cachalot fights us in turn. He can, when he chooses. He sometimes has fits of temper like a rhinoceros. Perhaps he mistakes the hulls of ships for rival whales. At any rate, cases are on record in which a charge from one of these whales has caused a vessel to return to port with all her timbers strained and leaking. We must imagine that the whale would not escape without a headache from such an encounter.

It is an error which credits these sea mammals with scales. Some such anomaly we might almost expect, perhaps, in the Bottle-nosed and Beaked whales, which seem even more fish-like than any we have yet considered. The Bottle-nosed species have a surprising crest on the upper side of the head, whose purpose we do not know; the Beaked whales have their jaws prolonged in the fashion their name suggests.

Seamen make many mistakes in their zoölogy, but they were right in saying that the bottle-nosed whales feed on cuttle-fish, for specimens naturalists have had in hand have revealed great scars on the bodies of this species showing where the immense force of the sucker-clad arms of the cuttles has raised huge weals upon their captors. The bottle-nosed varieties have only two teeth, and these never cut the gum. The beaked whales, however, have extraordinary teeth, in the lower jaw only, which curl up over the upper jaw. These whales are rare and we really know little about them.

We find the beak again in the Dolphins, which we often incorrectly call porpoises. They have the beak plan still more developed, but, then, they have capital teeth for seizing and holding scaly fish and teeth for chopping up cuttles. Air-breathers and glorious swimmers, they present a sightless species in the Indian Susu; but keen vision distinguishes the Amazon and La Plata examples of river dolphins.

WHAT OUR ANCESTORS THOUGHT OF THE NARWHAL AND ITS FORMIDABLE TUSK

The most remarkable genus of the dolphin tribe, however, is the Narwhal, an animal with a formidable tusk eight feet long, straight but spiral, coming from the upper left jaw. There may be a tiny tusk in the right; there may even be a large right tusk and a tiny left, but the rule is that the left side furnishes this implement. With it the males do battle. But, indeed, we know very little about this strange creature.

Our ancestors knew less but imagined more. To them the narwhal was the Sea Unicorn, full of "magic" in its tusk. Mightily content was Queen Elizabeth when Sir Martin Frobisher returned with one, almost his only trophy of a vain valiant dash to the Arctic. Would the superstitious Spaniards have fought her had they known she had it?

Then there is another dolphin which we call the White Whale, or Beluga, a picturesque beast. It is as unromantic in diet as the rest—cod, flatfish, shellfish and tons of cuttle. A prosperous specimen, measuring twenty feet, is good for one hundred gallons of oil, and its hide yields a sort of leather, so that the poor beluga is going the way of all whales, fast toward the end of its chapter of life.

THE PORPOISE THAT ROLLS AND TUMBLES WITH DELIGHT

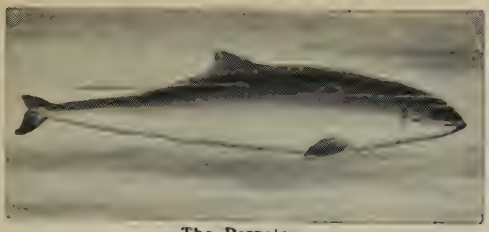
A more familiar form to landsmen is the true Porpoise, a creature smaller than the dolphins, lacking the beak and looking like a living torpedo. Porpoises swim up many of our rivers, the very embodiment of ease, well-being and fun. They are delightful creatures to watch as they roll and tumble and turn head over tail with the seeming delight of boys romping in a sun-warmed stream.

Because they eat fish and possess oil they are hunted as remorselessly as the other members of their tribe. Our porpoise leather is not always porpoise, being more often actually the hide of the white whale; but from the jaws of dolphins and porpoises comes an oil so fine that jewelers use it for lubricating watches.

Far and near the porpoises have traveled, settling down into several species. There is one peculiar to the Black Sea; the common species rove the Atlantic and Pacific, sometimes taking a trip into the Mediterranean, but it is more at home in the violent North, and was once so plentiful off European shores as to form an item of human diet. The Indian, the Heaviside, and the Irawadi dolphins have each their peculiarity of form and range, but we must pass to the Killer Whale, sometimes incorrectly called a grampus.

This is a highly perfected horror, a superb ferocity packed into a body

WHALES AND THEIR SMALLER COUSINS

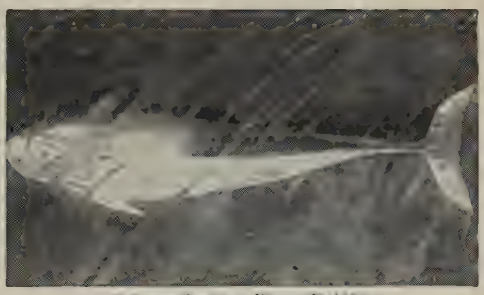


The Porpoise.

The Manatee.

The Killer Whale, about to attack its hunters.

The White Whale, or Beluga.



Pelorus Jack, a Risso Dolphin.

The Dugong.

The Narwhal.

twenty feet or more in length, which weighs a ton or more, and with such an appetite that in the stomach of a single individual have been found the remains of thirteen porpoises and fourteen seals. That dinner must have represented a ton and a half, for an animal twenty-one feet long.

THE KILLERS THAT FED ON THREE OF CAPTAIN SCOTT'S PONIES

The name of Killer was first given because several of these animals were known to attack a great Greenland whale. Such a battle is a sort of sea duplicate of a contest between wolves and some great elk. In face of these concerted tactics the monster becomes paralyzed with fear and lies as helpless as a fawn with a ferret at its throat. More and more bold and insistent become the furies, till at last they fasten on to the bleeding mouth of the giant and drag it under. But there is another terrible reason for the name, for they may even be killers of men!

Scott had a tragic experience of them. One day when ponies were being ferried by Bowers and others over ice, they were carried out toward open sea, and the party was attacked by killer whales, which raised themselves six feet out of the water to reach the ponies on the floe. One ice island tipped up, and three ponies were flung into the sea. Bowers, to save his ponies from being eaten alive, killed them in the water with his ice ax. Three little steeds were thus lost.

Shackleton, too, in that voyage which cost him his ship, had horrifying experiences with killers, while stranded on the ice before the great voyage could be begun in the open boat. It was only then that men learned for the first time the strength of these creatures.

THE SLEEPING-BAG THAT SHACKLETON CAUGHT JUST IN TIME

Swimming the sea beneath the ice, they must come up to breathe and to catch seals which they see afar upon the ice. They swim below the ice, then charge upward, and with a terrific blow from the head they smash the frozen lid of their domain. Once they shot up through ice over three feet thick, forming a circular opening twenty-five feet wide. Once, in the middle of an awful night, the ice parted beneath one of the tents in which the men slept, and Shackleton was just in time to seize a white object floating past in the water. It was a man in his sleeping-bag, sailing from the disrupted tent to two chances of death—to doom from icy water, or to killers which were blowing furiously in the next opening in the ice.

Coming next in classification to the killers, but very different from them in habits, are the so-called Blackfish, which are comparatively small sea mammals, congregating in shoals like flocks of sheep, and sheep-like also in the docile way in which they follow a leader. This instinct is profitable when it leads to a good haul of cuttlefish or away from dangerous waters, but sadly harmful when, as often happens, a school of the animals follow a misguided leader into shoal water to be stranded.

There are various other dolphins, but we can mention only their names. They are the White-sided, Pacific Short-beaked, White-beaked, Common dolphins, Dussumier's, Cape, Red-bellied, Slender, Malay, Bottle-nosed, Rough-toothed and Speckled dolphins; eight species of Long-beaked river dolphins, and Shark-toothed dolphins.

THE FAMOUS DOLPHIN THAT PILOTED SHIPS IN NEW ZEALAND WATERS

Of Risso's dolphin we must say a word, for this species gave us a historic animal. It was known in New Zealand waters as Pelorus Jack, and in a way it was as strangely friendly, almost domesticated, as some of the imaginary mermaids of which poets sing. For many years it was the self-appointed guide of ships plying between Pelorus Sound and French Pass dividing D'Urville Island from the mainland of New Zealand. It would dart out from unknown hiding, place itself at the head of a ship which emerged from the Sound, and romping and leaping through the water, would accompany the ship to the entrance of the Pass. There its act of pilotage ended, and it would return to the Sound.

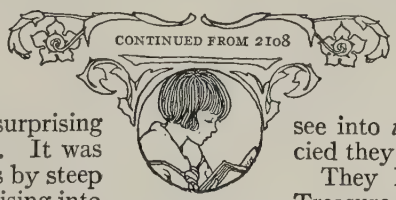
Jack was as well-known as any human pilot. Hardened passengers tried to shoot him for what they called sport, so the New Zealand Government passed an order in council specially protecting Jack from harm. He met with one accident, hit by the prow of a ship to which he hung too near, so he hid and healed for nine months, then came out remembering; never again did he touch a vessel.

THE NEXT STORY OF ANIMAL LIFE IS ON PAGE 2389.

JOHN RUSKIN'S FAIRY STORY

JOHN RUSKIN was a wise and clever man, a writer of beautiful books, an artist and a teacher. He had a great passion for truth and gentleness, and a great hate of anything unjust and false. We read in the Book of Literature of the life of John Ruskin, and of what he believed and taught. Once during his life John Ruskin did an odd thing: he wrote a fairy tale to please a girl friend who had come to stay at his home. It seemed to her that so wise a man could not write a simple fairy tale, but Mr. Ruskin's story, which he sat down to write on one day and finished on the second day, is a very good story, and shows us much truth and wisdom. It begins in these pages and ends on page 2350. There is a little left out but it does not make very much difference.

THE KING OF THE GOLDEN RIVER



IN a secluded and mountainous part of Styria there was, in old time, a valley of the most surprising and luxuriant fertility. It was surrounded on all sides by steep and rocky mountains rising into peaks which were always covered with snow, and from which a number of torrents descended in constant cataracts. One of these fell westward, over the face of a crag so high that when the sun had set to everything else, and all below was darkness, his beams still shone upon this waterfall, so that it looked like a shower of gold. It was therefore called by the people of the neighborhood the "Golden River."

It was strange that none of these streams fell into the valley itself. They all descended on the other side of the mountains and wound away through broad plains and by populous cities. But the clouds were drawn so constantly to the snowy hills, and rested so softly in the circular hollow, that in time of drought and heat, when all the country round was burned up, there was still rain in the little valley; and its crops were so heavy, and its hay so high, and its apples so red, and its grapes so blue, and its wine so rich, and its honey so sweet, that it was a marvel to everyone who beheld it, and was commonly called the "Treasure Valley."

The whole of this little valley belonged to three brothers called Schwartz, Hans and Gluck. Schwartz and Hans, the two elder brothers, were very ugly men, with overhanging eyebrows and small, dull eyes, which were always half shut, so that you couldn't see into *them,* and always fancied they saw very far into *you.*

They lived by farming the Treasure Valley, and very good farmers they were. They killed everything that did not pay for its eating. They shot the blackbirds, because they pecked the fruit; and killed the hedgehogs, lest they should suck the cows; they poisoned the crickets for eating the crumbs in the kitchen; and smothered the cicadas which used to sing all summer in the lime trees. They worked their servants without any wages, till they would not work any more, and then quarreled with them and turned them out of doors without paying them.

It would have been very odd if, with such a farm and such a system of farming, they hadn't got very rich; and very rich they *did* get. They generally contrived to keep their corn by them till it was very dear and then sell it for twice its value; they had heaps of gold lying about on their floors, yet it was never known that they had given so much as a penny or a crust in charity; they were of so cruel and grinding a temper as to receive, from all those with whom they had any dealings, the nickname of the "Black Brothers."

The youngest brother, Gluck, was as completely opposed, in both appearance and character, to his seniors as could possibly be imagined or desired. He was not above twelve years old,

fair, blue-eyed, and kind in temper to every living thing. He did not, of course, agree particularly well with his brothers, or rather they did not agree with him. He was usually appointed to the honorable office of turnspit, when there was anything to roast, which was not often; at other times he used to clean the shoes, the floors, and sometimes the plates, occasionally getting what was left on them, by way of encouragement, and a wholesome quantity of dry blows, by way of education.

Things went on in this manner for a long time. At last came a very wet summer, and everything went wrong in the country around. The hay had hardly been got in when the haystacks were floated bodily down to the sea by a flood; the vines were cut to pieces with the hail; the corn was all killed by a black blight; only in the Treasure Valley, as usual, all was safe. As it had rain when there was rain nowhere else, so it had sun when there was sun nowhere else.

It was drawing toward winter and very cold weather when one day the two elder brothers had gone out, with their usual warning to little Gluck, who was left to mind the roast, that he was to let nobody in and give nothing out. Gluck sat down quite close to the fire, for it was raining very hard, and the kitchen walls were by no means dry or comfortable-looking. He turned and turned, and the roast got nice and brown.

"What a pity," thought Gluck, "my brothers never ask anybody to dinner! I'm sure, when they've got such a nice piece of mutton as this and nobody else has got so much as a piece of dry bread, it would do their hearts good to have somebody to eat it with them."

Just as he spoke there came a double knock at the house door, yet heavy and dull, as though the knocker had been tied up—more like a puff than a knock.

"It must be the wind," said Gluck; "nobody else would venture to knock double knocks at our door."

No; it wasn't the wind: there it came again very hard, and, what was particularly astounding, the knocker seemed to be in a hurry, and not to be in the least afraid of the consequences. Gluck went to the window, opened it, and put his head out to see who was standing there in the rain.

It was the most extraordinary-looking little gentleman he had ever seen in his life. He had a very large nose, slightly brass-colored; his cheeks were very round and very red, and might have warranted a supposition that he had been blowing a fire for the last eight-and-forty hours; his eyes twinkled merrily through long silky eyelashes, his mustaches curled twice round like a corkscrew on each side of his mouth; and his hair, of a curious mixed pepper-and-salt color, descended far over his shoulders. He was about four feet six in height, and wore a pointed cap of nearly the same height decorated with a black feather some three feet long.

Gluck was so perfectly paralyzed by the singular appearance of his visitor that he remained fixed without uttering a word until the old gentleman turned round to look after his fly-away cloak. In so doing he caught sight of Gluck's little yellow head jammed in the window.

"Hello!" said the little gentleman. "That's not the way to answer the door; I'm wet, let me in!"

To do the little gentleman justice, he *was* wet. His feather hung down between his legs like a beaten puppy's tail, dripping like an umbrella; and from the ends of his mustaches the water was running into his waistcoat pockets and out again like a millstream.

"I beg pardon, sir," said Gluck; "I'm very sorry, but I really can't."

"Can't what?" said the old gentleman.

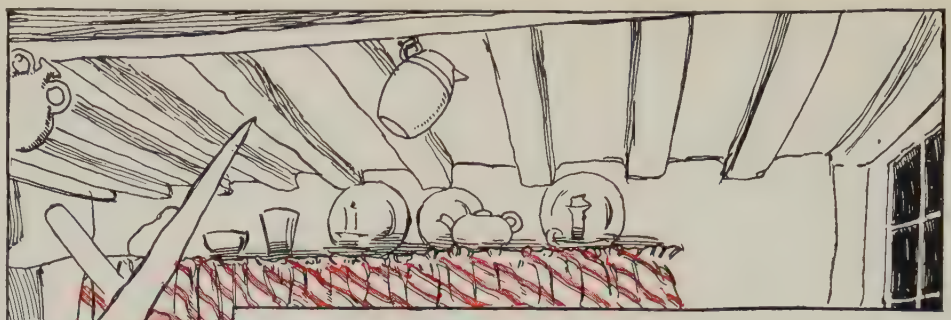
"I can't let you in, sir—I can't indeed; my brothers would beat me to death, sir, if I thought of such a thing. What do you want, sir?"

"Want?" said the old gentleman petulantly. "I want fire and shelter; and there's your great fire there blazing, crackling and dancing on the walls with nobody to feel it. Let me in, I say; I only want to warm myself."

Gluck had had his head, by this time, so long out of the window that he began to feel it was really unpleasantly cold, and when he turned and saw the beautiful fire rustling and roaring and

THE OLD GENTLEMAN WENT ON DRIP, DRIP, DRIPPING

The old gentleman went on drip, drip, dripping among the cinders, and his cloak ran like a gutter. "Mayn't I take your cloak?" said Gluck. "No, I'm all right, thank you," said the old gentleman.



throwing long, bright tongues up the chimney, as if it were licking its chops at the savory smell of the leg of mutton, his heart melted within him that it should be burning away for nothing.

"He does look very wet," said little Gluck; "I'll just let him in for a quarter of an hour."

Round he went to the door and opened it; and as the little gentleman walked in, there came a gust of wind through the house that made the old chimneys totter.

"That's a good boy!" said the little gentleman. "Never mind your brothers. I'll talk to them."

"Pray, sir, don't do any such thing," said Gluck. "I can't let you stay till they come; they'd be the death of me."

"Dear me," said the old gentleman, "I'm very sorry to hear that. How long may I stay?"

"Only till the mutton's done, sir," replied Gluck, "and it's very brown."

Then the old gentleman walked into the kitchen and sat himself down on the hob, with the top of his cap accommodated up the chimney, for it was a great deal too high for the roof.

"You'll soon dry there, sir," said Gluck, and sat down again to turn the mutton. But the old gentleman did not dry there, but went on drip, drip, dripping among the cinders, and the fire fizzed and spluttered, and began to look very black and uncomfortable; never was such a cloak: every fold in it ran like a gutter.

"I beg your pardon, sir," said Gluck at length, after watching the water spreading in long, quicksilver-like streams over the floor for a quarter of an hour; "mayn't I take your cloak?"

"No, thank you," said the old gentleman.

"Your cap, sir?"

"No, I am all right, thank you," said the old gentleman rather gruffly.

"But, sir, I'm very sorry," said Gluck hesitatingly; "but really, sir, you're putting the fire out."

"It'll take longer to do the mutton, then," replied his visitor dryly.

Gluck was very much puzzled by the behavior of his guest: it was such a strange mixture of coolness and humility. He turned away at the string meditatively for another five minutes.

"That mutton looks very nice," said the old gentleman at length. "Can't you give me a little bit?"

"Impossible, sir," said Gluck.

"I'm very hungry," continued the old gentleman. "I've had nothing to eat yesterday nor to-day. They surely couldn't miss a bit from the knuckle."

He spoke in so very melancholy a tone that it quite melted Gluck's heart. "They promised me one slice to-day, sir," said he; "I can give you that, but not a bit more."

"That's a good boy!" said the old gentleman again.

Then Gluck warmed a plate, and sharpened a knife.

"I don't care if I do get beaten for it," thought he. Just as he had cut a large slice out of the mutton, there came a tremendous rap at the door. The old gentleman jumped off the hob, as if it had suddenly become inconveniently warm. Gluck fitted the slice into the mutton again, with desperate efforts at exactitude, and ran to open the door.

"What did you keep us waiting in the rain for?" said Schwartz, as he walked in, throwing his umbrella in Gluck's face. "Ay! what for, indeed, you little vagabond?" said Hans, giving Gluck a box on the ear.

"Bless my soul!" said Schwartz, when he opened the door.

"Amen," said the little gentleman, who had taken his cap off, and was standing in the middle of the kitchen, bowing with the utmost possible velocity.

"Who's that?" said Schwartz, catching up a rolling-pin and turning to Gluck with a fierce frown.

"I don't know, indeed, brother," said Gluck, in great terror.

"How did he get in?" roared Schwartz.

"My dear brother," said Gluck deprecatingly, "he was so *very* wet!"

The rolling-pin was descending on Gluck's head; but, at the instant, the old gentleman interposed his conical cap, on which it crashed with a shock that shook the water out of it all over the room. What was very odd, the rolling-pin no sooner touched the cap than it flew out of Schwartz's hand, spinning like a straw in a high wind, and fell into the corner at the farther end of the room.

"Who are you, sir?" demanded Schwartz, turning upon him.

"What's your business?" snarled Hans.

"I'm a poor old man, sir," the little gentleman began very modestly, "and I saw your fire through the window and begged shelter for a quarter of an hour."

"Have the goodness to walk out again, then," said Schwartz. "We've quite enough water in our kitchen without making it a drying-house."

"It is a cold day to turn an old man out in. Look at my gray hairs."

"Ay!" said Hans, "there are enough of them to keep you warm. Walk!"

"I'm very hungry, sir; couldn't you spare me a bit of bread before I go?"

"Bread, indeed!" said Schwartz. "Do you suppose we've nothing to do with our bread but to give it to such red-nosed fellows as you?"

"Why don't you sell your feather?" said Hans sneeringly. "Out with you!"

"A little bit," said the old gentleman. all three. Then the old gentleman spun himself round, and replied with perfect coolness: "Gentlemen, I wish you a very good morning. At twelve o'clock to-night I'll call again; after such a refusal of hospitality as I have just experienced, you will not be surprised if that visit is the last I ever pay you."

"If ever I catch you here again," muttered Schwartz, coming, half frightened, out of the corner—but before he could finish his sentence the old gentleman had

Schwartz and Hans, the two elder brothers, ate as much mutton as they could.

"Be off!" said Schwartz.

"Pray, gentlemen."

"Off, and be hanged!" cried Hans, seizing him by the collar. But he had no sooner touched the old gentleman's collar than away he went after the rolling-pin, till he fell into the corner on the top of it. Then Schwartz was very angry and ran at the old gentleman to turn him out; but he also had hardly touched him when away he went after Hans and the rolling-pin, and hit his head against the wall as he tumbled into the corner. And so there they lay, shut the house door behind him with a great bang; and there drove past the window, at the same instant, a wreath of ragged cloud that whirled and rolled away down the valley in all manner of shapes, melting away at last in a gush of rain.

"A very pretty business, indeed, Mr. Gluck!" said Schwartz. "Dish the mutton, sir. If ever I catch you at such a trick again—— Bless me, why, the mutton's been cut!"

"You promised me one slice, brother, you know," said Gluck.

THE LITTLE GENTLEMAN AT THE WINDOW

"I want fire and shelter," said the old gentleman; "and there's your great fire there blazing, crackling and dancing on the walls with nobody to feel it. Let me in, I say; I only want to warm myself."

"Oh, and you were cutting it hot, I suppose, and going to catch all the gravy. It'll be long before I promise you it again. Leave the room, sir."

Gluck left the room melancholy enough. The brothers ate as much mutton as they could, locked the rest in the cupboard, and proceeded to get very drunk after dinner.

Such a night as it was! Howling wind and rushing rain, without intermission. The brothers had just sense enough left to put up all the shutters and double-bar the door before they went to bed. As the clock struck twelve they were both awakened by a tremendous crash. Their door burst open with a violence that shook the house from top to bottom.

"What's that?" cried Schwartz, starting up.

"Only I," said the little gentleman.

The brothers stared into the darkness. The room was full of water, and they could see in the midst of it an enormous foam globe spinning round and bobbing up and down like a cork, on which reclined the little old gentleman, cap and all. There was plenty of room for it now, for the roof was off.

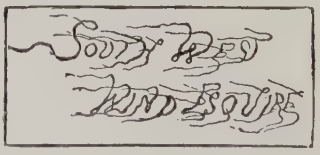
"Sorry to incommode you," said their visitor ironically. "I'm afraid your beds are dampish. Perhaps you had better go to your brother's room. I've left the ceiling on there."

They required no second admonition, but rushed into Gluck's room, wet through, and in an agony of terror.

"You'll find my card on the kitchen table," the old gentleman called after them. "Remember, the last visit."

"Pray Heaven it may be!" said Schwartz, shuddering. And the foam globe disappeared.

Dawn came at last, and the two brothers looked out of Gluck's little window in the morning. The Treasure Valley was one mass of ruin and desolation. The flood had swept away trees, crops and cattle, and left in their stead a waste of red sand and gray mud. The two brothers crept, shivering and horror-struck, into the kitchen. The water had gutted the whole first floor—corn, money, almost every movable thing had been swept away, and there was left only a small white card on the kitchen table. On it, in large, breezy, long-legged letters, were engraved the words:



THE NEXT PART OF THIS STORY IS ON PAGE 2343.

Chichester Canal, by J. M. W. Turner.

A CENTURY OF CHANGE IN ART

CONSTABLE, TURNER AND THE PRE-RAPHAELITES

CONTINUED FROM 2120

CLIMATE has more influence on art than we may at first realize. Our feeling for the beautiful is partly born in us and partly created by the unconscious daily use of our eyes and ears. So, that which any race calls beautiful and tries to immortalize in art is influenced by the sun and the weather.

Conceptions of form and color in an artist who has spent his life in a climate of changing days of mist and sun and rain and long twilights, amid soft outlines of trees and hills, will be very different from those of another artist whose experience has belonged to a land of hot, clear sunshine and brilliant effects where "sharp as a sickle is the edge of shade and shine." Southern eyes—in Greece and Italy, for instance—open morning after morning on distinct contours near and far: the sharp lines of a white town against a sapphire sea, the gray-black of olives cut out in bleached sandy spaces. Northern eyes, on the contrary, are accustomed to indefinite and changing contours, to shapes which at a little distance may be muffled and indistinct. Landscape paintings in England and Holland, then, to be natural must show blurred outlines and gradual-toned color.

Until the English painters began to make pictures of simple green fields and trees, there was a feeling in Europe that a landscape, to have any merit at all, must look as if it had been painted in Italy, and give the impression that just round the corner were some classical figures, and not far away was a ruined temple. Poussin and Claude Lorrain, the seventeenth-century French artists, who worked in Italy, were responsible for this tradition. Europe paid much more heed to them than to the sturdy Dutch masters who were establishing another kind of tradition in the Netherlands.

The forerunner of English landscape painting, Richard Wilson (1713–82), was strongly influenced by the classic tradition as represented in Claude Lorrain and Joseph Vernet. After he had realized his greatest ambition and had managed to go to Italy to study, he always recalled the look of Italian skies; and in his mind no pictured landscape was quite satisfactory without some classic building, some ruin or piece of statuary. But he had sincerity and a gift for composition, and he kept his own original method of presenting effects of light and air. His paintings have a tender golden tone.

They are "beautiful unrealities." Unhappily they were not received well in his lifetime, and his later years were clouded with discouragement and bitterness.

Wilson was a forerunner, rather than a leader, in the march of English landscape art. Next came Gainsborough, a true pioneer. He, as we have seen, in his tender affection for the green countryside of his home district transcribed its scenes truly and faithfully. "His landscapes are like windows opening on the country," rather than mere compositions. They are dignified, reposeful, and painted in the vibrating, loose way which was the secret of his technique. He did not feel the need of any far-fetched grandeur, or indeed of anything artificial. He painted things as he saw them, and so did the men who followed where he and Wilson had opened the way, and who gave their full attention to landscape.

BRITISH LANDSCAPE PAINTING, A LASTING INFLUENCE IN ART

Foremost among these were Constable, Crome and Morland. They had more in common with Ruisdael and Hobbema and the other Dutch landscape-painters than with the French and Italian schools. But, once they were known, they immediately influenced the French artists and became a lasting inspiration to foreign landscape art. These Englishmen were the first artists to "set up an easel in the fields."

George Morland (1763–1804), highly gifted, but sadly uncontrolled in his life and habits, has left several thousand paintings. He worked very fast and confidently, sometimes producing two pictures a day, paying his debts with pictures, and even occasionally sending a canvas to the dealer while the paint was still wet. You may have read on page 2334 how his familiarity with stable-yards and racecourses and inn yards had helped to make him thoroughly acquainted with the figures and ways of domestic animals. His painting of them was masterly, and they are an important factor in his landscapes. No other has surpassed him in the presentation of pigs. His scenes of humble life, faithful to nature, are given in fine, harmonious color and with delicate treatment. His masterpiece, The Interior of a Stable, is in the National Gallery, London.

John Crome (1768–1821) is better known as "Old Crome," since he had a son John, also an artist. Starting as a house- and signboard-painter, Old Crome —a young man, then—rented a garret for a studio and spent all the time he could in sketching out of doors. The Dutch artists became his masters, through their pictures which he saw and studied in the homes of wealthy gentlemen, after he had changed his occupation to that of drawing-teacher. Later, in Paris, he made broader acquaintance with them. But he painted chiefly English landscape—familiar and beloved—and his manner was his own. The touch of his brush was light and true; he gave careful attention to detail (sometimes, perhaps, too much); and his color is mellow and golden, yet delicate. Light and air play over his scenes. Trees he represented with unusual force and understanding, making them individual living things, as you can see if you look at The Old Oak, in the Metropolitan Museum, New York, or The Poringland Oak, in the National Gallery, London (shown on page 2231). Mousehold Heath and The Willow are others of his masterpieces.

Crome spent his life at Norwich and is remembered as the founder of the Norwich school of painters. He was not widely known during his lifetime, and his works did not bring high prices then; but his importance has increased until he has come to hold a high place among painters of landscape.

Among the followers of Crome the best were George Vincent and John Cotman. The latter, who in gift and achievement stands next to Crome himself, painted harbor scenes and quiet country landscapes. He is noted, besides, for etching and water-color work.

JOHN CONSTABLE, THE "FATHER OF MODERN LANDSCAPE"

In John Constable (1776–1837) we see the real "father of modern landscape." On page 2328 you have the story of the young miller who could not help being an artist, and whose mill at Flatford, by the river Stour in Suffolk, has in our day been presented by a member of Parliament to the British nation to be held in trust by the Royal Academy as a centre for a landscape school. For along the banks of this stream Constable wandered and mused and sketched, his whole spirit given in devoted companionship to the spirit of beauty in the country around him. "I love every stile and stump and lane in the village," he wrote, when he

LANDSCAPES BY THREE NOTABLE ARTISTS

Constable's famous picture of The Hay Wain.

The Poringland Oak, by John Crome.

The Cornfield, by Constable.

was away in London. The landscapes that he painted recording this intercourse with nature, are of the kind that picture what the French call *paysage intime* (the intimate countryside). It is a sort very familiar to us in modern painting, but Constable and his contemporaries were adventuring upon new paths when they started to paint green and blue landscapes that were bathed in light and air. "Do you not find it difficult to determine where to place your brown tree?" asked one of Constable's patrons who had in mind the pictures of earlier painters. "Not in the least," answered the artist, without an instant's hesitation, "for I never put such a thing into a picture."

A river scene, in water color, by Richard Bonington.

When we remember that he was doing something comparatively new and unfamiliar, it is not surprising that he was harshly criticized by many and that his landscapes were not in great demand. Because they were not sold and widely scattered it is possible now to see a number of them together in the National Gallery and in the South Kensington Museum, London. "Here," says one writer, "you may see him at every stage of his career, and there was hardly a moment in it when he was not inspired, and never a moment when he was not either actually or mentally recording the beauty of the visible world."

When in 1824 The Hay Wain and another of his canvases were exhibited in France, they made so great a sensation that they were given a place of honor, and the king of France sent the artist a gold medal. The painters of France were the first to recognize the excellence and charm of Constable's work and to respond to its challenge, and all of French landscape painting since has been different because of his influence.

The Hay Wain, with the two other greatest examples of Constable's art, The Valley Farm and The Cornfield, show bits of country close by his old home beside the Stour. The ten years between 1816 and 1826 cover the period of the artist's best work. On his later canvases he used the palette knife freely to press on spots and splashes of color —a custom very familiar in later art.

Constable saw landscape in large masses of form and color. He showed the gradations of the atmosphere. Bursts of sunlight coming between rolling clouds, restless or stormy skies give life to his scenes. The quiet streams, cultivated fields and stately trees are not exciting in themselves, but the feeling of reality and of movement is so strong that we can almost imagine a stir among the leaves and can almost hear the rippling of the water.

A name associated with Constable's as of one who helped to bring about the open-air school of landscape painting in France is that of Richard Bonington, for the works of the two Englishmen were exhibited at the same time in Paris. Bonington had been trained in France and had studied in Venice, but his painting showed something of the broad style of

Santa Giustina, Padua—from the water-color by J. R. Cozens.

Bray on the Thames—from the water-color by Peter de Wint.

Turner's famous picture, The Fighting Temeraire Towed to Her Last Berth.

Fishing Boats—from the water-color by Richard Bonington.

Hindu Devotions—a beautiful landscape by J. M. W. Turner.

Constable's. His subjects were principally seashore and street scenes.

Side by side with these painters of pure nature there lived one who, though he adored nature and lived, it would seem, only for the purpose of presenting to the world many aspects of her beauty, saw the natural world in a sort of dream glory of light. This was Joseph Mallord William Turner (1775–1851)—a man whose outer physical life had little relation to the splendors of imagery that must have brightened his inner existence. Son of a barber, unlovely in appearance, poorly educated, shrinking from society—you have his life-story on page 2336.

TURNER, WHO SAW NATURE IN A GLORY OF LIGHT

But who can guess what visions may have flashed within the mind of the odd little man and compelled him to paint? He painted light as no other had done. It seems as if the liquids he used were living substances saturated with the light and color of the earth. Here are strangeness, wonder and mystery mingled with the beauty of known things. Indeed, as time went on he became more concerned with producing magic effects by means of his colors than with trying to picture any real forms of nature. His experimenting was more than bold: it was sometimes reckless and almost meaningless; the colors he used on some of the later canvases have lost so much of their life and character that we can only guess his intention.

Resolved always to outdo others, Turner in his earlier years worked unwearyingly in water color, aiming to surpass Girtin, then the leader of the water-color school which he and an artist named Cozens had founded. Some of Turner's choicest pictures are in this medium—exquisite in coloring and true in their light effects. In his hands, after Girtin's death in 1802, water-color painting was lifted to a higher plane than it had ever before reached.

Through rivalry after rivalry with painters both British and foreign, whether they were living or dead, the ambitious Turner advanced—tramping, sketching, studying and painting, painting, painting—striving always to excel. His chief contest was with the famous paintings of Claude Lorrain of France, whose classic style and rich color he emulated. Among the pictures he bequeathed to England are two: The Sun Rising through Vapor, and Dido Building Carthage, which he directed should be hung between two Claudes in the National Gallery. These, with The Fighting Téméraire Towed to her Last Berth (shown on page 2233), are perhaps more familiarly known and more popular than his other oil paintings. The sea and shipping were favorite themes for his skill and fancy, appearing under many variations of light and atmosphere—sunset or sunrise, mist or golden floods of full sunlight.

It has been said that "no artist in the world was so steadily and unwearyingly and copiously productive as Turner." His best period lay in the years between 1829 and 1839, during which time he made several visits to Venice, leaving the world a brilliant record of his impressions there, both in water colors and oils. Of the latter a beautiful example is The Grand Canal, now in the Metropolitan Museum, New York, where several of his works in both mediums may be studied. Other collections, too, in Europe and America hold treasured canvases from his store. The great mass of his busy life's production, however, he kept together to bestow, at his death, upon his country. The extravagant praise of John Ruskin, the art critic, led to a prompt appreciation of Turner—even to overestimation of his importance; then revolt against this excessive praise brought about a swing in the other direction, when the pictures were less esteemed than they deserved; but time is steadying opinion to a more just view.

MANY SUCCESSFUL WORKERS IN THE MEDIUM OF WATER COLOR

The best of the water-color men besides Cozens, Girtin and Turner, Cotman and Bonington, were Thomas Stothard, Peter de Wint (of Dutch ancestry), David Cox and Copley Fielding. If Turner's genius had not glowed so brilliantly, these and others might have shone more conspicuously bright; for an astonishingly large number of British artists have done excellent work in this field.

Toward the middle of the nineteenth century art had fallen into a very different line from the straightforward portraiture and landscape of the best period. An era of pictures that tell stories and appeal to the feelings was making art more popular, particularly since many of the paintings were reproduced in engrav-

ing and in this form were distributed far and wide in the homes of the people.

It is unfortunate that the animal pictures of Sir Edwin Landseer, who lived from 1802 to 1873, have been known very largely through prints made from steel plates engraved by his brother Thomas. They were skillfully and sympathetically reproduced; but the engraver's technique is very different in feeling from the painter's, and this difference, together with the story-interest suggested by the title, makes a wide gap between the person who looks at the prints and Landseer who painted the originals. A view of the canvases themselves brings spectator and painter much closer together.

While the pictures are true animal portraits, they set before us the sentiments and qualities that belong to human beings. Pertness, pathos or fine courage are some of the impressions we catch from the pictures of dogs; dignity, annoyance or exhausted strength are suggested by some of his lions and deer. From small boyhood Landseer had unusual skill in drawing animals, and he studied them alive and dead until he was altogether acquainted with their anatomies and their habits; but his stag is called the "Monarch of the Glen"; his dogs are presented as "Dignity and Impudence," "Jack in Office," or the "Highland Shepherd's Chief Mourner." Quite different from the naturally placed, unposed animals in Morland's country scenes, Landseer's familiar company, like trained actors, take their parts in comic or tragic situations or ordinary episodes of daily life.

While the artist's method had more surface cleverness than depth of quality, he was a painter of ability and was made an Associate of the Royal Academy at twenty-four, the earliest age accepted. He was knighted in 1850.

Reforms sought by the Pre-Raphaelite Brotherhood

At just about this time a group of very young men with high ideals set themselves the task of lifting standards of art in Great Britain from the trivial taste and formal style into which it had dropped. They called themselves the Pre-Raphaelite Brotherhood because they felt that to get utter sincerity and exact truthfulness in art it was necessary to turn back for models to the work of the Italian painters before Raphael, such as Botticelli and Mantegna. In making an earnest and honest attempt to secure the true, the good and the beautiful they reached a studied simplicity, different from the natural simplicity of the early Italians, but of real value in its influence upon the taste of their own day and upon painting since. They wished to restore a more spiritual attitude, a more poetic feeling; and in their use of mystical and symbolical figures they sometimes went over the line into affectation. Their idealism was an idealism of the mind rather than of impulse.

At their best, however, the Pre-Raphaelite Brothers were simple and sincere, and gave their pictures a reverent spiritual quality. Yet it is not so much what they themselves painted that counts, as the influence of their ideas on what has been painted since. That can hardly be calculated.

Charm in art depends on individuality and personality

While Gainsborough, Constable, Turner and others we have been studying had turned aside from the conventions which painters had long accepted, they had not made any statement of principles for themselves or for others. This was to be the work of the Pre-Raphaelites, who made it clear that the true secret of charm in works of art is due to each artist's seeing things for himself and expressing them in the way that is natural to him; in other words, that there should be individual "observation filtered through personality." To this they added the requirement that every picture must be built around some worth-while idea.

In technique they put emphasis upon great carefulness and attention to detail, while with regard to color they made startlingly new effects. Painters of the time, trying to get the secret of mellow, dim coloring in the pictures of Rembrandt and other masters of the past, had believed in the necessity of using a dark mineral background for their oil paints. To break away from this custom was thought almost as shocking as to turn from some well-founded religious belief. Yet some of the Pre-Raphaelites began to use a wet white ground on which to lay their colors, declaring that this was the true secret of producing high lights and of giving the canvases fine and lasting coloring. Sometimes their colors were more than bright—even crude—and there

was not always an attempt at harmonizing them. Pre-Raphaelite pictures could not be overlooked when they were exhibited; therefore they were loudly attacked or as heartily praised. Charles Dickens was one of those who savagely criticized them. John Ruskin was their most eloquent and influential defender and supporter.

THE SEVEN YOUNG MEN OF THE PRE-RAPHAELITE BROTHERHOOD

The actual union of the Pre-Raphaelite Brotherhood lasted only from 1848 to 1853. It was made up of seven very young men, the leading members being William Holman Hunt, John Everett Millais (afterward Sir John) and Dante Gabriel Rossetti. Of these, Rossetti, a poet, had the greatest fund of literary knowledge and the most romantic turn of mind. He supplied novel plans and intellectual impulse. In his painting he was chiefly interested in working out ideas, treating of beauty in form, expression or color. He was more writer than painter, exhibiting few pictures.

Holman Hunt was a vigorous leader against the old conventions and traditions. He was in "grim earnest," ready to fight for his faith in this return to nature as the only salvation for art. As soon as he had money enough he went to Palestine to see and feel the actual conditions of light and setting in which Bible characters lived, so as to present them exactly in his scenes from scriptural narratives. His eager pains to get all details in his pictures perfect often led to a lack of unity in his compositions; for, looking so intently at things one by one, he lost the important effect of the whole.

Millais was the most gifted painter of the group, facile and bold and at times brilliant. He had the "pictorial eye and hand," though his mind was less imaginative and able than Rossetti's. While he worked with Holman Hunt in a comradely spirit, he had not the same determined rebellious intention to overthrow the old methods. His connection with the Brotherhood has been likened to the progress of a "swallow flitting through a great hall, in and out and done with it." He went on painting pleasant story-telling pictures that quickly won him the favor of the public.

The four other Pre-Raphaelite Brothers were Thomas Woolner, a sculptor; James Collinson, a painter; Frederic George Stephens, who became an art critic; and William Michael Rossetti, brother of Dante Gabriel, who also became well known as a critical writer on art subjects.

An older man than any of these, and a more experienced artist when the movement began, was Ford Madox Brown, once Rossetti's teacher. He was closely associated with the Brothers, influenced their work somewhat and "gave them his blessing," but never formally joined them. The name of Sir Edward Burne-Jones is another that is frequently mentioned in connection with the Pre-Raphaelites, for he was a pupil of Rossetti and painted in the same romantic, idealistic spirit. He did not, however, continue to use the same methods. His works are graceful and decorative in composition, this quality taking precedence of the thought in the picture.

All of these painters chose subjects from literature or from religious story and gave them romantic or mystical expression with the brush upon the canvas.

OTHER PAINTERS WHO CHOSE ROMANTIC AND SYMBOLIC THEMES

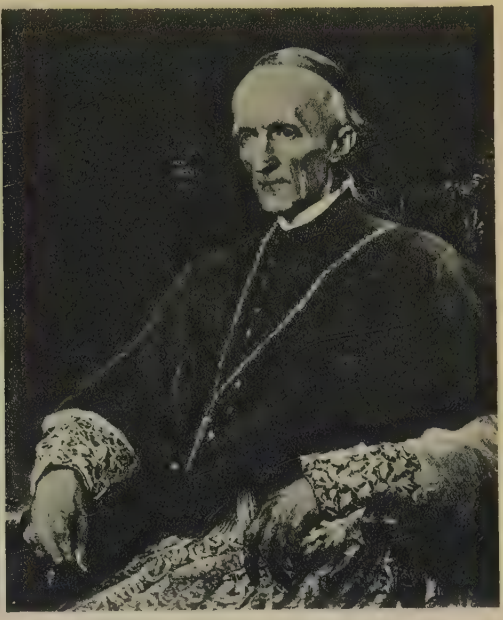
Albert Moore, a contemporary of Burne-Jones, like him produced pleasing decorative effects in mass and color. His treatment of draperies is particularly skillful. Frederick, Lord Leighton, devoted to Italy and to subjects taken from classic myth and from history, was a good draftsman whose work shows the results of study and of cultivated taste. Born earlier than this whole group and outliving them all, George Frederick Watts gave his long life to the pursuit of art—both painting and sculpture. Aiming to make his works valuable as lessons for uplifting mankind, he sometimes reached heights of grandeur. Usually his pictures are full of symbolism, serving as sermons in color. Among the best-known are: Love and Life, Love and Death, and Hope. Watts made some superb portraits—Gladstone, Browning, Tennyson, Rossetti and many other distinguished men counting among his sitters. These portraits have double value: as historical records and as works of art.

Another who excelled in portraiture is the Scotch artist Sir William Orchardson, who painted, besides, historical scenes like Napoleon on Board the Bellerophon, and genre pictures, chiefly of life in the early part of the nineteenth century.

THE NEXT STORY OF THE FINE ARTS IS ON PAGE 2369.

ART OF THE PRE-RAPHAELITE PERIOD

BEATA BEATRIX, BY DANTE GABRIEL ROSSETTI



CARDINAL MANNING, BY G. F. WATTS

CHRIST WASHING PETER'S FEET. FROM THE PAINTING BY FORD MADOX BROWN, IN THE TATE GALLERY

THE HIRELING SHEPHERD, BY HOLMAN HUNT, IN THE MANCHESTER ART GALLERY

LORENZO AND ISABELLA. FROM THE PAINTING BY SIR J. E. MILLAIS, IN THE WALKER ART GALLERY, LIVERPOOL

THE KNIGHT AT THE FORD. BY SIR J. E. MILLAIS

THE SONG OF LOVE. FROM THE PAINTING BY SIR EDWARD BURNE-JONES

THE ANNUNCIATION, BY D. G. ROSSETTI

AT THE GOLDEN GATE, BY VAL PRINSEP

THE QUARTETTE. FROM THE PAINTING BY ALBERT MOORE

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THE REALM OF FANCY

JOHN KEATS'S poem on Fancy, from which we take the first 66 lines, appeared in the volume, published in 1820, which established the fame of Keats as one of the immortal English poets. Keats says that by fancy we may range at once each of the seasons, and gather all the beauties of the year for our mind's enjoyment; and this he proceeds to show by choosing a medley of delights for sight and hearing—the harvest song, the birds, flowers, the rousing field-mouse, the swarming bees, the pattering acorns.

CONTINUED FROM 2155

EVER let the Fancy roam!
Pleasure never is at home:
At a touch sweet Pleasure melteth,
Like to bubbles when rain pelteth;
Then let wingèd Fancy wander
Through the thought still spread beyond her:
Open wide the mind's cage-door,
She'll dart forth, and cloudward soar.

O sweet Fancy! let her loose;
Summer's joys are spoilt by use,
And the enjoying of the spring
Fades as does its blossoming:
Autumn's red-lipped fruitage too,
Blushing through the mist and dew,
Cloys with tasting. What do then?

Sit thee by the ingle, when
The sear fagot blazes bright,
Spirit of a winter's night;
When the soundless earth is muffled,
And the cakèd snow is shuffled
From the ploughboy's heavy shoon;
When the Night doth meet the Noon
In a dark conspiracy
To banish Even from her sky.

Sit thee there, and send abroad
With a mind self-overawed,
Fancy, high-commissioned:—send her!
She has vassals to attend her;
She will bring, in spite of frost,
Beauties that the earth hath lost;
She will bring thee, all together,
All delights of summer weather;
All the buds and bells of May
From dewy sward or thorny spray;
All the heapèd Autumn's wealth,
With a still, mysterious stealth;
She will mix these pleasures up
Like three fit wines in a cup,
And thou shalt quaff it;—thou shalt hear
Distant harvest-carols clear;
Rustle of the reapèd corn;
Sweet birds antheming the morn;
And in the same moment—hark!
'Tis the early April lark,
Or the rooks, with busy caw,
Foraging for sticks and straw.

Thou shalt, at one glance, behold
The daisy and the marigold;
White-plumed lilies, and the first
Hedge-grown primrose that hath burst;
Shaded hyacinth, alway
Sapphire queen of the mid-May;
And every leaf and every flower
Pearlèd with the self-same shower.

Thou shalt see the field-mouse peep
Meagre from its cellèd sleep;
And the snake all winter-thin
Cast on sunny bank its skin;
Freckled nest-eggs thou shalt see
Hatching in the hawthorn-tree,
When the hen-bird's wing doth rest
Quiet on her mossy nest;
Then the hurry and alarm
When the bee-hive casts its swarm;
Acorns ripe down-pattering
While the Autumn breezes sing.

MY HOUSE*

What better dedication for a house could there be than these happily selected thoughts so aptly worded? The writer, Louis Untermeyer, is a well-known American poet belonging to the modern school of writers.

MAY nothing evil cross this door,
And may ill-fortune never pry
About these windows; may the roar
And rains go by.

Strengthened by faith, these rafters will
Withstand the battering of the storm;
This hearth, though all the world grow chill,
Will keep us warm.

Peace shall walk softly through these rooms,
Touching our lips with holy wine,
While every casual corner blooms
Into a shrine.

Laughter shall drown the raucous shout;
And, though these sheltering walls are thin,
May they be strong to keep hate out
And hold love in.

LITTLE GIFFEN

The writer of this fine true tale of the American Civil War was Francis Orrery Ticknor (1822–74), a doctor who described in verse the heroisms he witnessed in the midst of war's horrors.

OUT of the focal and foremost fire,
Out of the hospital walls as dire,
Smitten of grape-shot and gangrene;
(Eighteenth battle and *he* sixteen!)
Spectre such as you seldom see,
Little Giffen of Tennessee!

"Take him and welcome!" the surgeons said;
"Little the doctor can help the dead!"
So we took him; and brought him where
The balm was sweet in the summer air;
And we laid him down on a wholesome bed—
Utter Lazarus, heel to head!

And we watched the war with bated breath—
Skeleton Boy against Skeleton Death.
Months of torture, how many such!
Weary weeks of the stick and crutch;
And still a glint in the steel-blue eye
Told of a spirit that wouldn't die,—

And didn't. Nay, more! in death's despite
The crippled skeleton learned to write.
"Dear Mother," at first, of course; and then,
"Dear Captain," inquiring about "the men."
Captain's answer: "Of eighty-and-five
Giffen and I are left alive."

Word of gloom from the war, one day:
"Johnston pressed at the front, they say!"
Little Giffen was up and away;
A tear—his first—as he bade good-bye,
Dimmed the glint of his steel-blue eye.
"I'll write if spared!" There was news of the fight;
But none of Giffen.—He did not write.

I sometimes fancy that, were I king
Of the princely knights of the Golden Ring,
With the song of the minstrel in mine ear,
And the tender legend that trembles here,
I'd give the best on his bended knee,
The whitest soul of my chivalry,
For Little Giffen of Tennessee.

PIPER, PLAY!

John Davidson was a true poet, of Scottish birth, born in 1857. His life ended sadly in 1909, and the tone of his verse tended to be sad. But in these verses he tries to be gay as he describes tired workers tramping home from the factories, and feeling the simple joys of freedom and love.

NOW the furnaces are out,
And the aching anvils sleep;
Down the road the grimy rout
Tramples homeward, twenty deep.
Piper, play! Piper, play!
Though we be o'erlaboured men,
Ripe for rest, pipe your best!
Let us foot it once again!

Bridled looms delay their din;
All the humming wheels are spent;
Busy spindles cease to spin;
Warp and woof must rest content.
Piper, play! Piper, play!
For a little we are free!
Foot it, girls, and shake your curls,
Haggard creatures though we be!

Racked and soiled, the faded air
Freshens in our holiday;
Clouds and tides our respite share;
Breezes linger by the way.
Piper, rest! Piper, rest!
Now a carol of the moon!
Piper, piper, play your best!
Melt the sun into your tune!

We are of the humblest grade,
Yet we dare to dance our fill;
Male and female were we made—
Fathers, mothers, lovers still!
Piper—softly; soft and low;
Pipe of love in mellow notes,
Till the tears begin to flow
And our hearts are in our throats.

Nameless as the stars of night
Far in galaxies unfurled,
Yet we wield unrivalled might,
Joints and hinges of the world!
Night and day! night and day!
Sound the song the hours rehearse!
Work and play! work and play!
The order of the universe!

Now the furnaces are out,
And the aching anvils sleep;
Down the road a merry rout
Dances homeward, twenty deep.
Piper, play! Piper, play!
Wearied people though we be,
Ripe for rest, pipe your best!
For a little we are free!

* From This Singing World, by Louis Untermeyer; copyright, 1923, Harcourt, Brace & Co., Inc.

THE DAY THOU GAVEST

John Ellerton, the writer of this evening hymn, was a Church of England clergyman who died in 1893. The idea of praise and prayer arising unceasingly around the earth, as it revolves into sunshine and shadow, morning and evening, is here expressed with breadth and beauty.

THE day Thou gavest, Lord, is ended,
The darkness falls at Thy behest;
To Thee our morning hymns ascended,
Thy praise shall sanctify our rest.

We thank Thee that Thy Church unsleeping,
While earth rolls onward into light,
Through all the world her watch is keeping,
And rests not now by day or night.

As o'er each continent and island
The dawn leads on another day
The voice of prayer is never silent,
Nor dies the strain of praise away.

The sun that bids us rest is waking
Our brethren 'neath the western sky,
And hour by hour fresh lips are making
Thy wondrous doings heard on high.

So be it, Lord; Thy throne shall never,
Like earth's proud empires, pass away;
Thy kingdom stands, and grows for ever,
Till all Thy creatures own Thy sway.

CHORUS FROM ATALANTA IN CALYDON

Algernon Charles Swinburne was twenty-seven when, in 1864, he published Atalanta in Calydon, a drama on the Greek model. He was instantly hailed as a poet with exceptional lyrical qualities. It was this chorus that particularly arrested attention. Undergraduates marched about chanting it. Indeed, it has a wonderful swing, much poetical suggestion, and truth; but it has no hope. In this poem he reached the summit of his life's work.

BEFORE the beginning of years,
There came to the making of man
Time, with a gift of tears;
Grief, with a glass that ran;
Pleasure, with pain for leaven;
Summer, with flowers that fell;
Remembrance, fallen from heaven,
And madness, risen from hell;
Strength, without hands to smite;
Love, that endures for a breath;
Night, the shadow of light;
And life, the shadow of death.

And the high gods took in hand
Fire, and the falling of tears,
And a measure of sliding sand
From under the feet of the years;
And froth and drift of the sea;
And dust of the labouring earth;
And bodies of things to be
In the houses of death and of birth;
And wrought with weeping and laughter,
And fashioned with loathing and love,
With life before and after,
And death beneath and above,
For a day and a night and a morrow,
That his strength might endure for a span,
With travail and heavy sorrow,
The holy spirit of man.

From the winds of the north and the south
They gathered as unto strife;
They breathed upon his mouth,
They filled his body with life;
Eyesight and speech they wrought
For the veils of the soul therein,
A time for labour and thought,
A time to serve and to sin;
They gave him light in his ways,
And love, and a space for delight,
And beauty and length of days,
And night, and sleep in the night.
His speech is a burning fire;
With his lips he travaileth;
In his heart is a blind desire,
In his eyes foreknowledge of death;

He weaves, and is clothed with derision;
Sows, and he shall not reap;
His life is a watch or a vision
Between a sleep and a sleep.

A SONG FOR THE NEW YEAR

This lovely peep into the heart of a wise man growing old is from the pen of Edmund Gosse. As life lengthens, the knowledge of what is most worth having should grow clearer. Alike in what is rejected as unsatisfactory and what is chosen as lastingly dear, Dr. Gosse is a faithful guide, and his message is given in musical words. It has a directness and a simplicity which find an echo in every heart.

WHAT graven words shall mark as mine
This milestone of a year?
What prayer shall be the worthy sign
Of all I hope and fear?
Not greed for gold—
I'm growing old;
Burdens I dare no more uphold;
Nor deem I meet for weary feet
The dust and struggle of the street.

Then shall I wish for utter peace?
For light with calm around?
For all the stir of life to cease
In apathy profound?
Ah! no, too long
I've warred with wrong,
I've loved the clash of battle-song,
For me to drone in ease alone
Were heavier than a churchyard stone.

And fame? Alas! it comes too late,
Or, coming, flies too soon;
It dawns as o'er the meadow-gate
Peers up the yellow moon;
It glows in power
One feverish hour,
Then passes like a perished flower;
Or sets, to rise in alien skies,
And cheat me of my lawful prize.

Why, then, my New Year's wish shall be
For love—and love alone;
More hands to hold out joy to me,
More hearts for me to own;
And if the gain
In part be pain,
Since time but gives to take again,
Yet more than gold a thousandfold
Is love that's neither bought nor sold.

FLYNN OF VIRGINIA *

Bret Harte, the American poet, passed some of his early years among the Californian miners, and put their heroism and humor into verse that will remain a lasting memory of days and scenes that belong to the past. In these verses he gives a miner's account of a heroic deed.

DIDN'T know Flynn—
Flynn of Virginia—
Long as he's been 'yar?
Look'ee here, stranger,
Whar hev you been?

Here in this tunnel
He was my pardner,
That same Tom Flynn—
Working together,
In wind and weather,
Day out and in.

Didn't know Flynn!
Well, that is queer.
Why, it's a sin
To think of Tom Flynn—
Tom, with his cheer,
Tom, without fear—
Stranger, look 'yar!

Thar in the drift,
Back to the wall,
He held the timbers
Ready to fall;
Then in the darkness
I heard him call:
"Run for your life, Jake!
Run for your wife's sake!
Don't wait for me."
And that was all
Heard in the din,
Heard of Tom Flynn—
Flynn of Virginia.

THE FLOWERS

From 1823 to 1882 lived William Brighty Rands, an essayist and a very charming poet, many of his pieces being written for children. The thought in this poem is that greed and love cannot exist together and all the beauty of the world is linked with love.

WHEN Love arose in heart and deed
To wake the world to greater joy,
"What can she give me now?" said Greed,
Who thought to win some costly toy.

He rose, he ran, he stooped, he clutched;
And soon the flowers that Love let fall
In Greed's hot grasp were frayed and smutched,
And Greed said, "Flowers! Can this be all?"

He flung them down and went his way,
He cared no jot for thyme or rose;
But boys and girls came out to play,
And some took these and some took those—

Red, blue, and white, and green and gold
And at their touch the dew returned,
And all the bloom a thousand-fold;
So red, so ripe, the roses burned!

WAITING *

The writer of this familiar poem, John Burroughs, writer, farmer and poet, is best known for his charming descriptions of nature, especially of bird life. The central idea of the poem is that our lives are ordered and we fulfill a destiny, which we should accept calmly, though we cannot know what it is. Wake-Robin is perhaps his best-known book.

SERENE, I fold my hands and wait,
Nor care for wind, nor tide, nor sea;
I rave no more 'gainst time or fate,
For lo! my own shall come to me.

I stay my haste, I make delays,
For what avails this eager pace?
I stand amid the eternal ways,
And what is mine shall know my face.

Asleep, awake, by night or day,
The friends I seek are seeking me;
No wind can drive my bark astray,
Nor change the tide of destiny.

What matter if I stand alone?
I wait with joy the coming years;
My heart shall reap when it has sown,
And gather up its fruit of tears.

The stars come nightly to the sky;
The tidal wave comes to the sea;
Nor time, nor space, nor deep, nor high
Can keep my own away from me.

MISS POPPY

We have already been able to include in our Book of Poetry a number of pretty little lyrics by Mr. Frederic E. Weatherley, the well-known song-writer, and it is by his permission that this little song of the poppy is given here.

'TWAS on a summer morning,
Walking through the corn,
That I met a little maid
Looking all forlorn.

She had a scarlet petticoat,
So beautiful to see;
I wondered if this little maid
Would ever marry me.

I bowed to her, I spoke to her,
I gave her sweet good-day;
She only tossed her little head,
And turned the other way.

But oh, I loved her dearly,
And grew so very bold,
I took her hand, I kissed her lips,
Although they were so cold.

I took her in my loving arms,
And carried her away,
I said maybe she'll look on me,
And marry me next day.

But when I came next morning,
I found her dead, ah me!
She was only a scarlet poppy
That had grown beside the sea.

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GOOD-BYE

Emerson, the American philosopher and poet, here expresses his discontent with the garish world, and his desire for the peace of mind that comes to him by his own fireside or in the wild wood, close to nature and to God.

GOOD-BYE, proud world! I'm going home;
Thou art not my friend, and I'm not thine.
Long through thy weary crowds I roam;
A river-ark on the ocean brine,
Long I've been tossed like the driven foam:
But now, proud world! I'm going home.

Good-bye to Flattery's fawning face;
To Grandeur with his wise grimace;
To upstart Wealth's averted eye;
To supple Office, low and high;
To crowded halls, to court and street;
To frozen hearts and hasting feet;
To those who go, and those who come;
Good-bye, proud world! I'm going home

I am going to my own hearth-stone,
Bosomed in yon green hills alone,—
A secret nook in a pleasant land,
Whose groves the frolic fairies planned;
Where arches green, the livelong day,
Echo the blackbird's roundelay,
And vulgar feet have never trod—
A spot that is sacred to thought and God.

Oh, when I am safe in my sylvan home,
I tread on the pride of Greece and Rome;
And when I'm stretched beneath the pines,
Where the evening star so holy shines,
I laugh at the lore and the pride of man,
At the sophist schools and the learned clan;
For what are they all, in their high conceit,
When man in the bush with God may meet?

A PARABLE

A parable, of course, is a story designed to convey a lesson, and may be written either in prose or in verse. James Russell Lowell conveys a very beautiful lesson in this poem. The bursting into flower of a little mountain violet is as great a miracle as we need in order to believe in the everlasting Power that guides and sustains this world of ours. The word "eld" in the seventh stanza means "olden time," and comes from the Anglo-Saxon.

WORN and footsore was the Prophet,
When he reached the holy hill;
"God has left the earth," he murmured;
"Here His presence lingers still.

"God of all the olden prophets,
Wilt Thou talk with me no more?
Have I not as truly loved Thee
As Thy chosen ones of yore?

"Hear me, Guider of my fathers,
Lo, a humble heart is mine;
By Thy mercy, I beseech Thee,
Grant Thy servant but a sign!"

Bowing then his head, he listened
For an answer to his prayer;
No loud burst of thunder followed,
Not a murmur stirred the air;

But the tuft of moss before him
Opened while he waited yet,
And from out the rock's hard bosom
Sprang a tender violet.

"God, I thank Thee," said the Prophet
"Hard of heart and blind was I,
Looking to the holy mountain
For the gift of prophecy.

"Still Thou speakest with Thy children
Freely as in Eld sublime,
Humbleness and love and patience
Give dominion over Time.

"Had I trusted in my nature,
And had faith in lowly things,
Thou Thyself wouldst then have sought me,
And set free my spirit's wings.

"But I looked for signs and wonders
That o'er men should give me sway;
Thirsting to be more than mortal,
I was even less than clay.

"Ere I entered on my journey,
As I girt my loins to start,
Ran to me my little daughter,
The beloved of my heart;

"In her hand she held a flower,
Like to this as like may be,
Which beside my very threshold
She had plucked and brought to me."

THE TWO ARMIES

Oliver Wendell Holmes gives us in this poem a striking contrast. It is, perhaps, a poetic exaggeration to say the motto of valor's army is, "Our glory is to slay." It is easy, too, to contrast the ruthless work of the fighters, and the honor so readily awarded them, with the merciful and often unnoticed ministrations of the lovers of peace. But it is well that the kindly poets who love the quiet ways of life should thus remind us of those who serve in the army of peace.

AS Life's unending column pours,
Two marshalled hosts are seen—
Two armies on the trampled shores
That Death flows back between.

One marches to the drum-beat's roll,
The wide-mouthed clarion's bray,
And bears upon a crimson scroll,
"Our glory is to slay."

One moves in silence by the stream,
With sad, yet watchful eyes,
Calm as the patient planet's gleam
That walks the clouded skies.

Along its front no sabres shine,
No blood-red pennons wave;
Its banner bears the single line,
"Our duty is to save."

For those no death-bed's lingering shade;
At Honor's trumpet-call,
With knitted brow and lifted blade
In Glory's arms they fall.

For these no clashing falchions bright,
No stirring battle-cry;
The bloodless stabber calls by night—
Each answers, "Here am I!"

For those the sculptor's laurelled bust
The builder's marble piles,
The anthems pealing o'er their dust
Through long cathedral aisles.

For these the blossom-sprinkled turf
That floods the lonely graves
When Spring rolls in her sea-green surf
In flowery-foaming waves.

Two paths led upward from below,
And angels wait above,
Who count each burning life-drop's flow,
Each falling tear of Love.

Though from the hero's bleeding breast
Her pulses Freedom drew,
Though the white lilies in her crest
Sprang from that scarlet dew—

While Valor's haughty champions wait
Till all their scars are shown,
Love walks unchallenged through the gate,
To sit beside the throne!

SUPPOSE THE LITTLE COWSLIP

We have published in our book many little poems by unknown writers, simply because they have long and deservedly been children's favorites, and on this ground we can scarcely deny a place to these simple and pleasing verses.

SUPPOSE the little Cowslip
Should hang its golden cup
And say, "I'm such a little flower
I'd better not grow up!"
How many a weary traveller
Would miss its fragrant smell,
How many a little child would grieve
To lose it from the dell!

Suppose the glistening Dewdrop
Upon the grass should say,
"What can a little dewdrop do?
I'd better roll away!"
The blade on which it rested,
Before the day was done,
Without a drop to moisten it,
Would wither in the sun!

. . . . . .

How many deeds of kindness
A little child can do,
Although it has but little strength,
And little wisdom too!
It wants a loving spirit
Much more than strength, to prove
How many things a child can do
For others by its love.

BONNIE JEAN

The tender feeling which breathes through every line of this most charming love lyric makes it a gem of its kind, and it ranks among the finest of Burns's many songs. The third and fourth verses are thought to have been written by another poet, but they are in perfect harmony with the opening verses.

OF a' the airts the wind can blaw
I dearly like the West,
For there the bonnie lassie lives,
The lassie I lo'e best:
There wild woods grow, and rivers row,
And mony a hill between;
But day and night my fancy's flight
Is ever wi' my Jean.

I see her in the dewy flowers,
I see her sweet and fair:
I hear her in the tunefu' birds,
I hear her charm the air:
There's not a bonnie flower that springs
By fountain, shaw, or green,
There's not a bonnie bird that sings
But minds me o' my Jean.

O blaw ye westlin winds, blaw saft
Amang the leafy trees;
Wi' balmy gale, frae hill and dale
Bring hame the laden bees;
And bring the lassie back to me
That's aye sae neat and clean;
Ae smile o' her wad banish care,
Sae charming is my Jean.

What sighs and vows amang the knowes
Hae pass'd atween us twa!
How fond to meet, how wae to part,
That night she gaed awa!
The Powers aboon can only ken
To whom the heart is seen,
That nane can be sae dear to me
As my sweet lovely Jean.

PAULINUS AND EDWIN*

The conversion here recorded by Francis Turner Palgrave is said to have taken place at Doncaster when Edwin, the Northumbrian king, met Paulinus, a monk sent by Pope Gregory, with Augustine, to convert the English. The warrior who advised Edwin to accept the new religion, which told men whence they were come and whither they were going, is usually referred to as a priest named Coifi.

THE black-haired, gaunt Paulinus
By ruddy Edwin stood:
"Bow down, O King of Deira,
Before the holy rood!
Cast forth thy demon idols,
And worship Christ our Lord!"
But Edwin looked and pondered,
And answered not a word.

Again the gaunt Paulinus
To ruddy Edwin spake:
"God offers life immortal
For His dear Son's own sake.
Wilt thou not hear His message,
Who bears the keys and sword?"
But Edwin looked and pondered,
And answered not a word.

Rose then a sage old warrior,
Was five score winters old,
Whose beard from chin to girdle
Like one long snow-wreath rolled;
"At Yuletide in our chamber
We sit in warmth and light,
While cavern-black around us
Lies the grim mouth of Night.

"Athwart the room a sparrow
Darts from the open door;
Within the happy hearth-light
One red flash, and no more!
We see it born from darkness
And into darkness go—
So is our life, King Edwin!
Ah, that it should be so!

"But if this pale Paulinus
Have somewhat more to tell,
Some news of whence and whither,
And where the soul may dwell;
If on that outer darkness
The sun of Hope may shine,
He makes life worth the living,
I take his God for mine."

So spake the wise old warrior,
And all about him cried:
"Paulinus, God hath conquered,
And He shall be our Guide;
For He makes life worth living
Who brings this message plain:
When our brief days are over
That we shall live again."

* By permission of The Macmillan Company, publishers.

LITTLE VERSES FOR VERY LITTLE PEOPLE

I MUST not throw upon the floor
The crust I cannot eat,
For many an hungry little one
Would think it quite a treat.

'Tis willful waste brings woeful want,
And I may live to say,
"Oh, how I wish I had the crust
That once I threw away."

MARY had a little lamb,
Its fleece was white as snow;
And everywhere that Mary went,
The lamb was sure to go.

He followed her to school one day—
That was against the rule;
It made the children laugh and play,
To see the lamb at school.

So the teacher turned him out,
But still he lingered near;
And waited patiently about,
Till Mary did appear.

Then he ran to her, and laid
His head upon her arm,
As if he said, "I'm not afraid,
You'll keep me from all harm!"

"What makes the lamb love Mary so?"
The eager children cry.
"Oh, Mary loves the lamb, you know,"
The teacher did reply.

MONDAY'S child is fair of face,
Tuesday's child is full of grace,
Wednesday's child is full of woe,
Thursday's child has far to go,
Friday's child is loving and giving,
Saturday's child works hard for its living,
And a child that's born on the Sabbath day
Is fair and wise and good and gay.

UPON yon nearest rock-top
Can you see a dwelling stands?
Ah, 'tis the sweetest dwelling
Found in these mountain lands!

It holds the sweetest lady!
She is rich with golden hair,
Has clever, busy fingers,
Though so small and lily fair.

They wash, they starch, they broider.
They can spin, mix oaten cake,
And grind the white wheat finely,
The dainty loaves to bake.

And when that sweetest lady
Shall be mine, my own to hold,
Ah, earth to match her beauty
Will wear a crown of gold!

THE Owl and the Pussy Cat went to sea
In a beautiful pea-green boat;
They took some honey and plenty of money
Wrapped up in a five-pound note.

The Owl looked up to the stars above
And sang to a small guitar;
"Oh, lovely Pussy, oh, Pussy, my love,
What a beautiful Pussy you are!"

Pussy said to the Owl: "You elegant fowl,
How charmingly sweetly you sing!
Oh, let us be married, too long have we tarried—
But what shall we do for a ring?"

So they sailed away for a year and a day
To the land where the bone-tree grows;
And there in a wood a piggy-wig stood,
With a ring at the end of his nose.

"Dear Pig, are you willing to sell for one shilling
Your ring?" Said the Piggy, "I will."
So they took it away and were married next day
By the Turkey that lives on the hill.

They had apples and quince and piles of mince
Which they ate with a silver spoon,
And hand in hand on the edge of the sand
They danced by the light of the moon.

IN LONDON ONCE I LOST MY WAY

IN London once I lost my way,
In faring to and fro,
And asked a little ragged boy
The way that I should go.
He gave a nod and then a wink,
And told me to get there,
"Straight down the Crooked Lane,
And all round the Square."

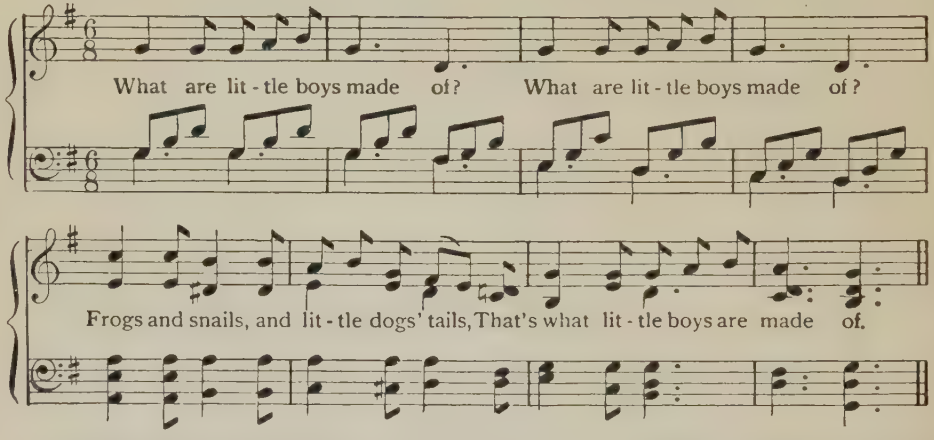
I boxed his little saucy ears,
And then away I strode;
But, since, I've found, that weary path
Is quite a common road.
Utopia is a pleasant place,
But how shall I get there?
"Straight down the Crooked Lane
And all round the Square."

I've read about a Fairy Land,
In some romantic tale,
Where dwarfs, if good, are sure to thrive,
And wicked giants fail.
My wish is great, my shoes are strong,
But how shall I get there?
"Straight down the Crooked Lane
And all round the Square."

I've heard about a pleasant land,
Where omelettes grow on trees,
And roasted pigs run, crying out,
"Come, eat me, if you please!"
My appetite is rather keen,
But how shall I get there?
"Straight down the Crooked Lane
And all round the Square."

They say there is a garden fair,
That's haunted by the dove,
Where love of gold doth ne'er eclipse
The golden light of love.
The place must be a paradise,
But how shall I get there?
"Straight down the Crooked Lane
And all round the Square."

WHAT ARE LITTLE BOYS MADE OF?


What are lit - tle boys made of? What are lit - tle boys made of?
Frogs and snails, and lit - tle dogs' tails, That's what lit - tle boys are made of.

A NURSERY RHYME OF THE CHILDREN OF FRANCE

The French and English versions of this Rhyme are side by side.

SUR le pont d'Avignon,
L'on y danse, l'on y danse;
Sur le pont d'Avignon,
L'on y danse tout en rond.
Les beaux messieurs font comm' ça,
Et puis encore comm' ça.
Sur le pont d'Avignon
L'on y danse, l'on y danse;
Sur le pont d'Avignon
L'on y danse tout en rond.
Les belles dames font comm' ça
Et puis encore comm' ça;
Sur le pont d'Avignon
Tout le monde y danse en rond!

ON the bridge of Avignon,
See them dance, see them dance!
On the bridge of Avignon,
They trip around, retire, advance.
Gallant swains bend low, like this,
And once again do so, like this.
On the bridge of Avignon,
See them dance, see them dance!
On the bridge of Avignon,
They trip around, retire, advance.
Fair ladies curtsey low, like this,
And once again do so, like this.
See them dance, see them dance,
On the bridge of Avignon.

WHERE DOES THE RAIN GO?

CONTINUED FROM 2125

MANY things happen to the rain that sinks in the earth. Exactly what happens depends largely on what the surface of the earth is like at that particular place. A great deal of the rain remains in the soil to the depth of some feet, as soil-water or ground-water. If there is no such water, there can be no vegetable life. But in places where rain falls and the ground holds some of it, there we are sure to find plants of various kinds. These suck up a good deal of this water into themselves by their roots, and then give some of it back to the air. The soil also contains all sorts of life of other kinds besides green plants, such as various kinds of animals, like worms and insects, and also countless numbers of microbes. All these take up and use for their lives some of the water that the rain gives to the soil.

But still a great deal of the rain is not used up in any of these ways. Much of it is sucked up again into the air by the sun's heat when the rain stops falling. Much of it also goes on sinking slowly through the earth until it reaches a layer of something that it cannot sink through. It may be carried along this layer to some lower level, where it may bubble up out of the ground as what we call a spring. In the long run, almost all the rain that is not kept by living things, or given back to the air at once, gets into streams and rivers, and into the sea, where the sun sucks it up to form water-laden clouds and send it on its round again.

How deep it is possible for rain to sink depends on several circumstances. It might be thought that if rain were constant and copious enough, it might sink to any depth and finally be lost altogether. But, however heavy and continuous rain may be, there are limits to the depth to which it may sink. It is certain to reach some substance through which it cannot pass soon. In many cases this is clay. Indeed, except for the clay there would be much less water above the surface and much less under it. The clay acts like a cup and collects the water. Artesian wells are made possible by a layer of clay under porous earth, where the rain-water accumulates and can be tapped by boring.

Even if there be no such material as clay through which water does not pass, the great pressure in the deep crust usually renders it water-tight, and at a certain depth the heat of the crust is great enough to convert the water into steam.

WHY HAS NOT SMOKE A FORCE LIKE STEAM?

The proper way to find out the answer to a question like this is first to discover why steam has force. When we do this we shall probably find that the important fact about steam to which it owes its force is not true of smoke.

Now, steam is a word which we use in rather different senses. Sometimes we use the word steam for the cloud that comes from a kettle; but every engineer knows that that kind of steam is not of much use in his engines: in fact, it has no more force than smoke has.

The steam that *does* work and has force is water-vapor confined in a small space and pressing in all directions outward so as to get more room for itself. It desires to expand, and it is this force of expansion that makes it so useful. When it has got out into the air, and has taken as much room as it pleases, it has no more force. The force is not in the cloud of steam outside the kettle, but in the steam inside that raises the kettle-lid.

Smoke, on the other hand, has no force because it has no tendency to expand. Smoke is, indeed, not a gas at all, but only a quantity of small pieces of solid matter which, not being very heavy, can be carried in a stream by the gases escaping from a chimney. These gases might have some force if they were confined in a small space. Once we understand where steam gets its force, we shall see there is no reason why smoke should have any force.

WHY DO MOUNTAINS GET NO HIGHER THOUGH SNOW FALLS ON THEM?

Plainly something must happen to the snow which falls on mountains, or they would be bound to get higher. As new snow falls on the old, the old is pressed from above, and it tends to slide by its own weight down the mountain. In this way it is very tightly squeezed into ice. Though we think of snow as a light thing, a mountain-cap of ice many feet thick has tremendous weight. As it slowly sinks down the mountainside it makes a bed for itself, as water does when it runs along the land; and so there is formed a river of ice which we call a glacier. The glacier may run into the sea and form icebergs, or it may melt when it gets low enough upon the mountainside. Some of the snow, but only a small amount, may form into avalanches, and some of the snow even on the top of mountains melts in the sun and evaporates or runs away. So we see that the snow that falls on a mountain shares in that endless circulation of water—from sky to earth and sea, and back to sky again—which is going on always, everywhere.

WHAT IS MEANT BY A FUSE IN TALKING ABOUT ELECTRICITY?

When a house or a motor car is wired, it is known how much electricity the wires can carry safely. Sometimes more current passes than the wires were intended to carry. Perhaps an accident has happened and two wires are touching and one is taking current from the other. Now, every wire carrying a current of electricity is heated by the passage of the current. If the wire is too small for the amount of current which passes along it, it grows very hot and a serious fire, or an injury to a person may result. So somewhere in the circuit a short piece of soft metal called a fuse is placed. This is made of a mixture of lead and bismuth, and melts if the wire gets hotter than is safe. Then no current can pass as the circuit is broken, and the danger is over. Sometimes not all the lights in a house are on one circuit, and we should have a fuse for every circuit.

WHY CANNOT TWO PEOPLE DECIDE DISPUTES?

It is only the bad passions of men which prevent this from being possible. If two good and honest men, or two good and honest countries, have a difference of opinion about something, they could meet and talk it over and try to find out what is the right thing to do. If they cannot agree, they could appoint some other person or country that they both trust to decide what is the right thing, and agree in advance to what is decided. The person who does this in a game of ball is called the umpire. The Latin word for an umpire is *arbiter*, and so, when nations or employers and workmen use this method of settling their differences it is called *arbitration*. It is, of course, in every way the best plan for settling all kinds of differences.

But all nations are not good and honest, and if a nation wants something it has no right to have, and knows that no arbitrator would award that thing to it, its politicians invent some excuse, usually about the nation's honor, and the nation proceeds to dishonor itself by making war.

WHY HAS AN OLD CLOCK FOUR MINUTE SPACES INSTEAD OF FIVE?

If we look at an old Grandfather Clock, we see that between one hour mark and another there are sometimes four spaces instead of five, as in a modern clock.

The explanation is that the original clocks were made with only one hand, that which we call the hour hand. In the old days there was no separate long hand to indicate the minutes, and therefore there were no minute marks such as we have now.

The five divisions between the hour marks in a modern clock represent the minutes; the four divisions between the hour marks on an old clock represent the division of the hour into quarters.

Our forefathers, when they looked at the clock, read the time by one hand only, and the four divisions told them broadly whether it was a quarter, half or three-quarters of an hour.

DO ANIMALS FEEL AS MUCH PAIN AS WE DO?

This cannot be answered directly; indeed, when we come to think of it, we shall see that no one of us can really compare the amount of pain he feels with what anyone else feels. We cannot feel anyone else's pain, and so we can judge questions like this only indirectly. Different human beings feel pain differently. Small babies and children are probably less hurt than grown-up people are by the same thing, though we may be misled by the fact that grown-up people usually control better the results of pain.

Probably women are slightly less sensitive to pain than men. It is well known that, on the average, they can drink fluids hotter, or hold hotter plates, without pain, than men can. The lower races of mankind differ immensely from ourselves in this respect. For instance, a savage will often cut and mutilate his body and take very little or no notice of it.

It seems certain that animals feel pain less than we do. Their nervous systems do not seem to be so highly organized as ours. The stroke of a whip, which would hurt us terribly for hours and leave a mark for days, must certainly feel very different to a horse; and we know that a horse will contentedly eat his food and never move his head in the slightest while a vein or artery is being opened in his body. This does not give us the right to inflict pain, however.

WHY HAS A POSTAGE STAMP A PERFORATED EDGE?

Stamps are printed in large sheets, and the perforations enable them to be torn off singly or in large numbers without any risk of damaging them. Incidentally, the perforations, by marking a conspicuous gap between the stamps, enable large numbers to be counted quickly.

The British post office was the first to begin the use of stamps in May, 1840, but they were not officially perforated until January, 1854, except in the parliamentary session of 1851. Then stamps perforated by a Mr. Archer were issued at the House of Commons, and were so much liked that in 1853 the Government paid Mr. Archer $20,000 for the patent.

Now many business firms stamp perforated initials on their stamps so that if they are stolen they cannot be sold, for no post office would buy them nor any firm receive such stamps in payment for goods, and if otherwise used they could readily be traced.

Marginal perforations vary in number on stamps of different countries, and are a subject of great interest to stamp-collectors, who use a special gauge for measuring and counting them.

WHEN WE ARE LOOKING AT A RAINBOW CAN PEOPLE SEE THE OTHER SIDE?

This is a natural question, and, of course, the whole answer to it depends on what a rainbow is. If it is anything like what it appears to be, there is no reason why, when we are looking at one side of it, other people should not be looking at the other side—as if it were, say, the arch of a railway bridge. But it is impossible that anyone can be seeing the other side of the rainbow.

What we call the rainbow is made by the reflection of sunlight from drops of water in the sky. Therefore, to begin with, the rainbow can appear to us only on the side of us opposite to the sun. Anyone trying to look at the other side of the rainbow would be looking toward the sun. Owing to the very nature of a rainbow, one can never be seen in this position. Now, if a rainbow is formed by the reflection of light from drops of water suspended in the sky that are so placed as to have our eyes between them and the sun, plainly there can be no other side to the rainbow.

WHY DOES INK STAIN WHILE WATER DOES NOT?

Water does not stain because it contains nothing that can stain. It may produce a mark because, where it falls, it may wash out coloring matter from a fabric, as in the cover of a book, but in pure water there is nothing melted or hung—dissolved or suspended, to use the proper words—that the water can leave behind where it falls. Milk has a number of tiny balls of oil hung in it, and in falling upon anything it is apt to leave behind a certain number of these balls of oil, which we call cream.

The case of ink is quite different, for this is water containing a number of colored things melted in it, among them salts of iron—a metal which has this peculiarity, that nearly all its salts are very highly colored. There is one peculiar salt, or mixture of salts, of iron that is deeply colored. It is called Prussian blue, and is often used in ink.

Ink stains because when this solution, as it is called, of salts is exposed to the air, the water flies away into the air, and the coloring matter is left dry, staining the paper, or the tablecloth, or whatever it may have fallen upon.

DO THE PEOPLE AT THE POLES SPIN ROUND LIKE A TOP?

Of course there are no human beings actually living at either the North or South Pole, but that does not make the question about the spinning any less interesting. If we think of a spinning top, we shall see that all parts of it move round in the same time, but that different parts are moving at different speeds, for those near the bulgy part of the top—near its equator—have farther to go in the same time than those near its poles.

Now, in the case of the spinning top that we call the earth, it is necessarily true that all parts of it complete a revolution in twenty-four hours. This must apply equally to the man standing beside the North Pole and a man at the Equator, for the earth moves all in a piece—not like the sun or Jupiter, different parts of which lag behind the other.

The man at the Equator is being whirled along at the rate of about a thousand miles an hour, but a man actually standing on the North or South Pole, on the point of the very axis of the earth, is simply being turned completely round once in twenty-four hours, while his brother at the Equator has been whirled through twenty-five thousand miles. So, though at the Poles people would spin like a top, they would notice nothing, for the spinning would be so slow.

WHAT IS THE SUBSTANCE KNOWN AS OZONE?

Ozone is a gas which is really a special form of oxygen, as diamond is a special form of carbon. It is slightly blue in color, and, as its molecule contains three atoms of oxygen, chemists represent it by the symbol O_3.

The gas has a smell something like garlic or chlorine, and when heated, it soon breaks up into ordinary oxygen. Formerly it was supposed to occur in small quantities in the atmosphere at the seaside, and people talked about going to the sea to breathe the ozone. But a clever scientist, Dr. Benjamin Moore, of the National Institute for Medical Research, proved that the gas at the seaside which was supposed to be ozone is actually another gas called nitrogen peroxid, and that, instead of being produced by electricity during thunderstorms, as was formerly supposed, it is really produced by strong light, such as that of the sun. There is no natural ozone close to the ground at all; you would have to go up five miles to find any.

Ozone is produced in large quantities by chemists, and is used for the bleaching of oils, waxes, flour and ivory, and for sterilizing drinking water.

HOW IS A HORSE MEASURED?

We say that a horse stands so many hands high, and this varies from seven to ten hands for a Shetland pony, to fifteen or seventeen hands for such magnificent animals as the Shire, Percheron, Clydesdale and the thoroughbred. The hand is a measure of length equal to four inches, and is used only for measuring horses. It came into use from the breadth of a man's palm, and it is probable that the placing of palm over palm up the foreleg of a horse to the shoulder once formed a rough-and-ready way of measuring it, much as we can roughly judge a length by spanning it if we know that the distance we can stretch comfortably from the tip of the thumb to the tip of the little finger is, if we are grown up, about eight inches, or if we play the piano perhaps a little more.

THE NEXT WONDER QUESTIONS ARE ON PAGE 2359.

Jane Austen at work in her study.

THE TELLERS OF TALES

CONTINUED FROM 2138

PROBABLY three-fourths of the books that are read to-day by grown-ups for pleasure are novels.

Their popularity comes from the fact that by studies of human character, and how it is affected by the emotion of love, novels bring all kinds of men and women into books. Can we wonder at their popularity?

And yet the novel, as we know it, is little more than a century and a half old. Of course story-telling is as old as civilization, by voice in narration, by acting on the stage, and in books telling through verse and through prose, of romantic characters and deeds. But the novel as a distinct form of literary art is nearly new.

It is true that the prose tale was very well known through Lyly, Lodge, Greene and Sidney in the sixteenth century, through Mrs. Behn in the seventeenth century, and Defoe in the early eighteenth century. But these early forms of novel were stories of adventure rather than studies of character under the influence of love. The novel as it exists to-day dates its beginning from 1740, when Samuel Richardson published his story Pamela, and started the fiction of everyday life.

A quaint little figure was that of the great story-teller in those early days to which we have here turned back. He was the son of very humble parents, his father being an ordinary carpenter in Derbyshire, where, in the year 1689, Samuel Richardson was born.

Boys and girls need not be expected to read any of his stories until they have grown up, and, even then, there is no particular reason why they should read them at all. Still, Richardson bears one of the greatest names in the history of English literature.

Richardson's stories were chiefly written in the form of long-winded letters supposed to be addressed by one character to another. Nowadays our lives are much too varied and active to leave time for reading such very long and unexciting stories as he wrote, but our great-great-grandfathers had more leisure and fewer interesting books, so that they could find time to follow the slow and steady unfolding of his appallingly lengthy tales. Indeed we may guess how interested they could be in his stories when we are told that in country villages people used to wait anxiously for the arrival of the next part of his novels to find out what was to happen to the characters, and when the heroine of his dreary story, Pamela, was made to marry the rather unmanly hero, church bells were rung in some villages as

though Pamela had been a real person!

This is all very strange to us now, for neither that story nor Clarissa, which he took eight years to write, nor Sir Charles Grandison, has the slightest attraction for people of our time. These are interesting only for students of the age in which they were written, and for literary critics who trace the growth of fashions in writing.

Samuel Richardson had very little education, and at the age of seventeen he was apprenticed to a London printer, who made him work so hard that he had no leisure for reading or study. But he was as industrious as he was honest, and he made up for the time of which his master robbed him by sitting up at night, when he ought to have been asleep, to read any books he could secure. The candles used for these midnight studies he bought himself, so that his master might not have to pay.

An unambitious, steady, plodding, honest and industrious, and perhaps a very commonplace young man was this Samuel, but after fifteen years he had some reward from the printer, as he married his master's daughter, having now become a printer on his own account in a court off Fleet Street, close by the old Church of St. Bride. Here he continued for many years to carry on his business like any other printer of his time, living above his workshop, and thus spending most of his time amid the smell of printer's ink. We can well believe that he was a kind and considerate master, and it is said he used to hide a silver coin among the types at night so that the first man to arrive at the workshop in the morning might have it as a reward!

Richardson was not far short of fifty years old when he determined to make himself famous by writing a novel, and Pamela was the result of the little printer's resolution. He certainly succeeded in making himself famous, and, being perhaps somewhat vain of his literary powers—which at the early age of thirteen he had first exercised by writing love-letters for some ignorant servant girls—the remainder of his days was spent with much satisfaction in writing for the sentimental ladies of his time, to whom the languishing and tearful heroines of his novels seem to have been strangely attractive.

THE END OF ONE GREAT STORY-TELLER AND THE BEGINNING OF ANOTHER

The little printer of Salisbury Square, though so few of us read his writings today, certainly gave a great impetus to the art of fiction in England, and the careful and elaborate way in which he traced the natures of imaginary people was also imitated by writers on the Continent, and chiefly in France, where to this day the works of Richardson are in high repute. He died on July 4, 1761, and by his own request was buried in the Church of St. Bride, near to which so much of his life had been passed.

When an author invents some unusual way of telling a story, it frequently happens that another author will turn it into ridicule by writing what is called a parody of it. So it happened with Richardson's Pamela, which an abler and far more gifted man than he, two years after its appearance, took as the idea of a very different sort of story called Joseph Andrews.

The writer of this was a born story-writer, a man of great force of character, the son of distinguished parents, and well educated. His name was Henry Fielding, and he was born in Somersetshire on April 22, 1707.

HOW HENRY FIELDING WAS FORCED TO WRITE STORIES FOR A LIVING

Being fond of the pleasures of life and disinclined to work or to study too closely, Fielding left the University of Leyden, in Holland, and returned to London, when he was twenty. But he soon found that his father was not able to allow him so much money as he had expected, and he had to exercise his abilities by writing for the stage.

After a while he married a beautiful lady who had a small fortune; but this he soon contrived to spend, and at thirty-three he became a barrister, though it was chiefly by writing books that he made his living. His wife died in 1743, and he then married a servant, who was a very good wife to him for the rest of his days. Poor man, he was not long to enjoy the success of the great books he had written, nor the advantage of the comfortable salary he received from a legal appointment given to him in 1749.

It was in that year that he wrote a very brilliant satire called Mr. Jonathan Wild the Great, and in the same year appeared his most celebrated novel, The

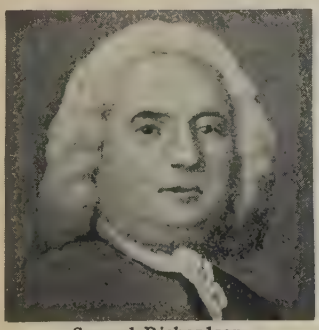
THE OLD ENGLISH STORY-TELLERS

Tobias Smollett.

Jane Austen.

Horace Walpole.

The sisters of Moses, a simple character in the Vicar of Wakefield, believed to have been modeled on the youth of Goldsmith himself, prepare their brother for the Fair.



Samuel Richardson.

Maria Edgeworth.

Henry Fielding.

History of Tom Jones, which is one of the great masterpieces of English fiction. His third and last novel was Amelia, which appeared in 1751. All his stories are written with a fine, vigorous feeling of life, and overflow with humor, a quality in which Richardson was utterly deficient.

In 1754, while on a visit to Lisbon, where he had gone broken in health, he died, and there in the cemetery of the British Factory—for in those days there were many such trading-posts under the flag in foreign countries—one of the greatest of England's story-tellers, one of the earliest of her novelists, was laid to rest.

LAURENCE STERNE AND TOBIAS SMOLLETT AND THE BOOKS THEY WROTE

Laurence Sterne, like Jonathan Swift, whom he resembled to some extent in character, was born in Ireland, though his ancestors were English people of good position in Church and State. He was born on November 24, 1713, and educated at Halifax Grammar School and Cambridge University, becoming a clergyman in the year 1738. For a good many years his life was, no doubt, that of an ordinary English country vicar, except that, being at once satirical and bitingly sarcastic in his speech, thin in appearance and poor in health, he was probably by no means so pleasant a companion as a country vicar ought to be.

When he was forty-six years of age he published at York the first two volumes of his clever and amusing book, The Life and Opinions of Tristram Shandy. Very soon the wit and humor with which the characters in this great work were drawn had made the name of Sterne famous, and for years new volumes of the work continued to appear, until it was completed in the year 1767, just about two months before its author breathed his last.

On the whole, Sterne was not a pleasant kind of man to contemplate, and although his books are full of high spirits and laughter, it is not always the healthiest laughter, nor are his sentiments such as do credit to a preacher of the Gospel, who during his later years may be said to have written under the shadow of death. His other famous book is called The Sentimental Journey through France and Italy. It is very witty.

Tobias Smollett was a Scotsman, born near the "bonnie, bonnie banks of Loch Lomond" in March, 1721. He went to school at Dumbarton, and to Glasgow University, and when he was about fifteen was apprenticed to a surgeon in Glasgow. He wished, however, to be a writer, and at the age of eighteen went to London with a play which he had written in his pocket. But no one would buy the play, and as he had no money, he went to sea as assistant to a naval surgeon.

After his return to London he practiced as a surgeon, and as he married a lady who had some wealth, he wrote for a time more for pleasure than for profit. Later he adopted writing as a profession. He became a journalist, wrote histories and books of travel, translated foreign stories and edited papers. But, above all, he produced three novels very similar in character to those of Henry Fielding, and nearly always mentioned in company with them as the best examples of English novels written before the time of Sir Walter Scott. They are full of interesting and lifelike characters, and his sailors, especially, are the breeziest, saltest sons of the sea to be found in English story-books. The names of his three famous books are Roderick Random, Peregrine Pickle and Humphrey Clinker, the first being written in 1748, and the last, which is also the best, in 1771, in the September of which year Smollett died at Leghorn, in Italy, and was buried in the English cemetery there.

In a former chapter (Doctor Johnson and his Friends) we have read about Oliver Goldsmith, whose Vicar of Wakefield is one of the most beautiful stories in the English language. Although a dramatist (his comedy She Stoops to Conquer is a perfect stage play) and a poet (Johnson called him "the greatest poet since Pope"), we must never forget the importance of his work as a story-teller as well. No one reading his book to-day would remember that the novel form was so newly finished when he wrote, so easy is the narrative and so natural the plot.

In 1766 Oliver Goldsmith published his Vicar of Wakefield, and in 1778 Fanny Burney her Evelina. These novels were free from the vein of coarseness that spoils Smollett and mars Fielding. Goldsmith did not again attempt fiction. Miss Burney, who had begun with great promise and won well-deserved popular-

ity, spoiled her style in her later novels, Cecilia and Camilla, by imitating Doctor Johnson's most formal compositions. Before the close of the eighteenth century the novel had been fairly started in London, and had been purified from its first failures in good taste, though it long kept a doubtful name.

In less than fifty years the writers of novels became very many, and a larger proportion of the honors of success began to go to women than had been gained by them in any other field of literature. As with the drama in Shakespeare's day, fiction reached its greatest height of glory almost suddenly. Less than forty years lay between the coming of the better novel in the Evelina of Fanny Burney, and the capture of the whole reading world by the novels of Sir Walter Scott. This sudden collection of stories, so varied in time, character and subject, can only be compared with the abundance of Shakespeare's plays two hundred years before.

Fiction broadened out, after the domestic period of Richardson, into wild and romantic fancies. A fashion had been set by Horace Walpole in his Castle of Otranto, a fearsome, supernatural story. Walpole put his talents into all kinds of things, and of course must try story-telling.

THE WRITING THAT PLEASES FOR THE MOMENT AND THEN FADES AWAY

He was followed by other writers bent on making the reader's flesh creep with mysteries. For a time, too, the novel made a fashion of using fine language that was quite unnatural. The most popular writer of the day was Mrs. Ann Radcliffe. Her Romance of the Forest is still worth reading as an illustration of a kind of fashion that, under various forms, creeps again and again into fiction, and is thought to be thrillingly fine by the uncritical. Being unnatural, it fades away and is only smiled at by a later generation of readers.

Two women novelists who wrote about the time of Sir Walter Scott and who hold the field between Fanny Burney and Scott, are Maria Edgeworth and Jane Austen. Maria Edgeworth began the localizing of the novel—that is, the special study of the character, manners and speech of a district. Her ground was rural Ireland, and her success probably had some effect in prompting Scott to present to the world in fiction the Scotsman, past and present.

The Edgeworths were an English family made Irish by living in Ireland for two centuries. They kept up a constant connection with England, where Maria Edgeworth was born, and while they were quite Irish in their ways they were able to see Ireland from the outside as well as the inside.

THE MASTERFUL IRISHMAN WHO SPOILED HIS DAUGHTER'S WRITING

Maria Edgeworth's father was a wayward man of genius, fanciful, masterful and full of fads, and one of his fads was to regulate the writings of Maria according to his own ideas. As his ideas of writing a novel were clumsy, his admiring daughter was handicapped by his interference; but her pictures of the Ireland she knew, in Castle Rackrent, The Absentee and Ormond, are the best pictures we have of that country in the past.

Miss Edgeworth brought fiction back to real life; and because she makes us feel she is writing about men and women as they are, her stories will live as pictures of life in the past that have a historical as well as a human value.

And so it is in an even greater degree with Jane Austen's novels. Besides, these are of a choicer workmanship. Jane Austen was a Hampshire lady, daughter of the rector of Steventon, where she was born on December 16, 1775. Her first complete novel, but one that was not published till after her death, Northanger Abbey, was a mixed description of Bath, then the chief health resort and social centre of England, and a clever exposure of the style of Mrs. Radcliffe's tales, in the height of their popularity. But Sense and Sensibility (1811), Pride and Prejudice (1813), Mansfield Park (1814) and Emma (1816), the first two written long before the last two, make up a complete study of ordinary life in rural England.

THE DELICATE ART OF AN OBSERVANT ENGLISH COUNTRY LADY

Readers who want sensation, high-flown sentiment, an exciting or involved plot, stirring adventure, problems of passion or boisterous laughter need not trouble themselves with Jane Austen. They can find what they want in sensational stories that sell in tens of thousands to-day, and are forgotten five years hence, never to be recalled. But Jane Austen, writing only about a quiet life which she knew very well, gives us a picture of the thoughts and ways of Eng-

lish gentlefolks at the end of the eighteenth century. It is faithful in drawing and delightful in its quiet humor.

Of the life of the poor and humble we scarcely have a glimpse in her books, and the governing class that circled round the court is equally left alone. It is the comfortable landed gentry who might be known to a much-respected clergyman's family to whom Jane Austen introduces us. If we are content to judge her writing only by what she tried to do, then it gives us the most finished picture of a section of English society that any novelist has drawn. Scott himself, the noblest-hearted of men, spoke of her writing with a generous envy, and she will long remain an English classic.

It has been said, and there is some truth in the criticism, that Jane Austen has but a few different kinds of character in her stories. The men and women in any one story are much like those of any other story, but with their circumstances and aims somewhat changed. That was likely to be when a rather narrow round of country life was being shown with no sensational characters or incidents introduced. But this only makes the quality of her skill the finer when she holds our interest and makes the story vividly real.

She fully understood her own limitations, and never tried to do what was beyond her power. She wrote herself of "the little bit of ivory, two inches wide, on which I work with so fine a brush as produces little effect—after much labor." But that fails to do justice to her method, though it suggests it. Scott was nearer the truth when he spoke of "the exquisite touch which renders commonplace things and characters interesting from the truth of the description and the sentiment."

Miss Austen lived a very quiet country life, with gradually failing health before she reached middle age. She died at Winchester in her forty-first year on July 18, 1817, and is buried in the Cathedral.

OLIVER GOLDSMITH AND THE FAMOUS STORY THAT PAID HIS DEBTS

Oliver Goldsmith was so improvident that he was always in difficulties. Once his landlady had him arrested for debt, and when his friend, the great Dr. Johnson, found him a prisoner in his lodgings, Goldsmith showed him the manuscript of a story he had written, and Johnson was immediately charmed with it. He took it out and managed to sell it at once to a bookseller for $300, which enabled Goldsmith to pay his landlady and get rid of the bailiffs. The manuscript was the famous story known as The Vicar of Wakefield.

THE NEXT STORY OF LITERATURE IS ON PAGE 2353.

MAKE THIS HANDY CUTTING-BOARD

CONTINUED FROM 2168

EVERY home should have at least one of these convenient cutting-boards for bread, meat and vegetables. The exact size and shape of the board should be determined by the particular use which will be made of it in the household. For this reason you will find it most satisfactory to talk this matter over with your mother before you decide just how large your cutting-board is to be made.

The small board shown in the accompanying drawing has been selected because it is easily made and has been found satisfactory for ordinary use. Although the working drawing specifies a thickness of ¾ inch, a width of 7 inches, and a length of 12 inches, these dimensions may be modified to suit the purpose in each case. In fact, some persons prefer an oval or circular shape to the rectangular form shown.

After you have decided upon the dimensions of the cutting-board the selection of suitable wood is the most important consideration. You should not only secure a wood which is free from open-grain knots and other blemishes, to aid in cleanliness, but you should also avoid using any wood which has a distinctive odor of any kind. For example, either a so-called soft wood, such as poplar, or a hard wood, such as maple, will be found entirely satisfactory. If neither of these woods is available, just select from the materials at hand the one which seems best suited to this purpose and is in keeping with the qualities mentioned above. Of course, in any case, the wood selected for the cutting-board should be thoroughly

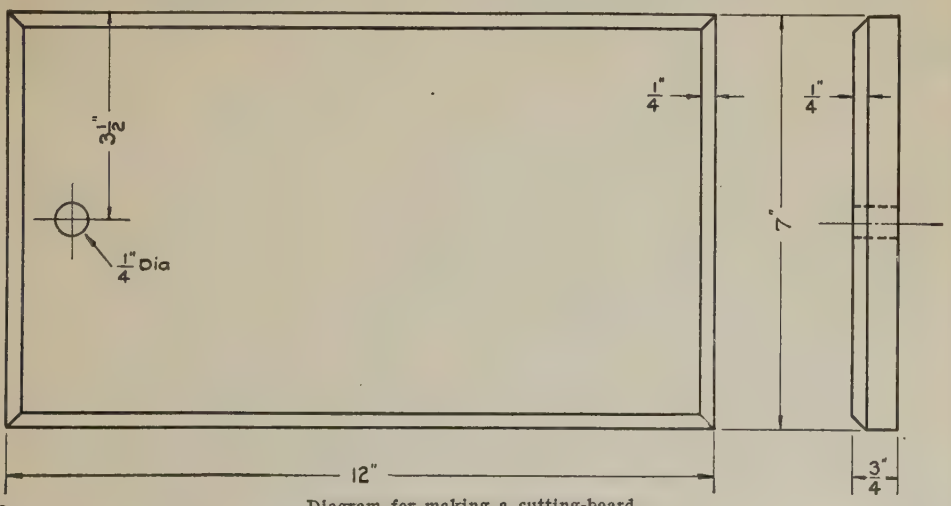


Diagram for making a cutting-board.

seasoned in order that the possibility of warping may be avoided. It is possible to glue two or more pieces which have been properly planed if a board of the desired width is not to be had.

In shaping the cutting-board as shown in the working drawing, it will be found that time can be saved by first planing one edge of the board before laying out the perpendicular lines for the ends and the parallel line for the opposite side. After sawing out the piece and planing to size, a bevel, or chamfer, is made by marking off ¼ inch from the top edges in either direction and drawing lines parallel to the edge, in order that the chamfer may be uniform on all edges after it has been planed. This needs careful measuring.

A hole is next bored with a ¼-inch auger bit so that the cutting-board may be hung up if desired. This hole should be located in the middle and about ¾ inch from one end. In boring the hole it is suggested that a piece of wood be clamped on the opposite side of the board to prevent the auger bit from splintering the wood when it reaches the other side. This same result may be secured by completing the hole by boring from the opposite side as soon as the auger begins to appear. Either of these two methods will save ragged edges.

All surfaces of the cutting-board are now carefully sandpapered to remove any rough spots and edges. Either fine or old sandpaper should be used in finishing the board. As it is washed frequently, the wood should be left in its natural state. The cutting-board is now ready for use.

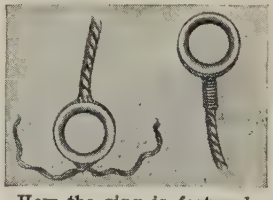
HOW TO MAKE AND USE A LASSO

EVERY boy who has read stories about the Indians and the Wild West—and what boy has not?—knows all about the lasso, or lariat, and admires the wonderful skill with which the Indians and the cowboys can throw the noosed rope around whatever object they may aim at.

Apart from its great use on the prairie, there is much amusement to be obtained from practice with the lasso. The exercise obtained in throwing the rope is very valuable in strengthening the body, developing the muscles, and training the eye.

We can easily make a lasso for ourselves, and with a little regular practice on a common or on a field, or even in a fair-sized garden, we can become expert in throwing the noose so that it will slip over a post, or anything else at which it may be aimed. Later on we can lasso moving objects.

First of all, we obtain a suitable rope. This should be about 25 feet or longer, of a good quality, and flexible in character. Then we should get at an ironmonger's an iron ring with a deep groove running round the outer rim. The hole of the ring should be considerably greater in diameter than the diameter of the rope.



How the ring is fastened.

We now take the rope and unravel one end of it for about 12 inches. Dividing the unraveled strands into two equal parts, we bring them right round the ring as shown in the first picture—half the strands in one direction and half in the other.

Pulling them tightly round the ring, we plait the ends round the rope, and fasten them by binding them to the rope with thick, strong twine, as seen in the picture. The other end of the rope we bind round tightly with twine to prevent its unraveling, and when we have put this end through the iron ring, our lasso is complete and quite ready for use.

Selecting a post about 3 or 3½ feet high as a target, we stand 15 or 20 feet from it. We pull the length of rope through the iron ring which we fastened at one end, until a loop about 6 feet in length is left. Then coiling the rope until about 7 feet is left loose between the coil and the loop, we hold the coil loosely in the left hand, as shown very clearly in the picture above.

With the right hand we grasp the loop, or noose, about 15 or 18 inches from the ring, at the same time, and with the same hand, grasping the rope at a similar distance from the ring. The picture shows exactly how we hold the noose.

Using our right hand as a centre, and keeping the wrist flexible, we swing the noose round and round above our head, from right to left, gradually making the movement swifter; then, as the noose comes round to the front, we reach forward with the arm stretched out full length in front, and let the rope go at the post. In doing this we do not slacken the swinging movement of the rope.

We may perhaps at the very first attempt place the noose over the post, in which case we at once pull the rope and tighten the noose. But probably considerable practice will be needed before we are successful.

THE ANSWERS TO THE PROBLEMS ON PAGE 2166

1. He was right. Feathers are weighed by avoirdupois weight and gold by troy weight. An ounce troy has 480 grains, but 1 ounce avoirdupois has only 437½ grains. But a pound troy has only 12 ounces or 5,760 grains, while a pound avoirdupois has 16 ounces or 7,000 grains, so that an ounce of gold is heavier than an ounce of feathers, but a pound of gold is lighter than a pound of feathers.

2. It would take 4 hours to walk the 16 miles still to go, but cycling is the quicker way. If James rides 8 miles in 1 hour, and then, leaving the machine, walks right on, he will complete the journey in 3 hours. If John walks for 2 hours he will come to the machine and can ride it the remaining 8 miles in 1 hour, thus arriving at the same time as James.

3. He knew the name of the village from which he had come, and by supposing that the arm of the signpost with that name pointed in the direction from which he had cycled, he was able to tell what roads were indicated by the other arms.

4. The first candle burns for 6 hours and the second for 4 hours. In 2 hours (8:30 to 10:30) the first burns as much as the second burns in 1½ hours (8:30 to 10). Hence, in 6 hours the first burns as much as the second in 4½ hours, so that the second would require ½ hour to burn 1 inch, and it must have been 8 inches long originally, while the first must have been 9 inches long.

5. Six words. To send a telegram between any two places in this country costs at least 25 cents. The difference between the price to Albany and to London was $1.25. If we add to this sum the minimum charge for a telegram in this country, 25 cents, we would have $1.50, which would pay for a telegram of 6 words to London.

6. The amount spilled would have served the man who died for 8 days, and this, at 1 quart each day, would have been 8 quarts.

7. I would meet 11 trains coming in the opposite direction, including the one that would be arriving as I started and the one that would be starting as I arrived. There is 24 hours' difference between the starting times of the trains; but as the trains from opposite sides are going toward each other at the same speed, each train will pass another train every 12 hours. Since it takes five days to cross the continent, I should naturally meet the trains which had left on the five days previous to my starting.

8. Yes, the second farm was the bigger, and was more than twice as large as the other. Three miles square is 3 miles each way and contains 9 square miles, while the other farm contained only 4 square miles. A diagram will prove this at once.

9. When his father is three times as old as Harry, the difference between their ages must be twice Harry's age; but the difference between their ages is always 44. Therefore, Harry will be 22 when his father is three times as old. Harry, then, will get the bicycle in 10 years' time.

HOW TO TELL TIME BY THE SUN

IN primitive times, and even in the early days of our own country, time was reckoned by the rising and going-down of the sun, the shortening and lengthening of shadows. The savage still uses primitive methods for noting time. He sets a stick in the ground and marks its shadow with a stone, so that a party following him may estimate the leader's distance ahead by noting the changed position of the shadow which measures the length of time since he went by.

This gives the idea of the sundial, which marks time by the shadows and indicates noon when the shadow is shortest. The simplest form of sundial is a tree-trunk or post standing "plumb," by which we may follow the changing direction of the shadows thrown by the sun. But this dial is not accurate, for in winter the shadows are longer than they are in summer, and the sun itself does not keep good time, for some days it is fast and some days it is slow. There are only four days in the year when it is strictly on time, April 15, June 15, September 1, and December 25. The post must be parallel to the axis of the earth, so that the shadow will be the same all the year around. Only at the North and South Poles would the post stand straight up and down.

It is interesting to know that the earliest mention of a sundial was made by the prophet Isaiah about seven hundred years before the birth of Christ. No one knows what Isaiah's instrument for telling the time was like or how accurately it counted the hours, but probably it was like the one we see to-day.

The old-time stick method of telling time was used by our great-grandmothers, who could tell it was time to cook dinner when the sun's shadow fell at a certain point. Some became expert in telling time by the way the shadows fell across the porch or doorway. It is easy enough to tell when it is nearing midday, for then a man's shadow becomes slowly shorter, until it seems to be fixed, the sun having reached its highest point. It is easy, too, to tell when it is just past noon, for then the shadow becomes slowly lengthened. This crude method of telling noontime is just the same as the accurate method of "taking the sun" to determine noon at sea, when the mariner with his instrument, the sextant, measures the angle between the horizon and the sun.

THE ANSWERS TO THE GAME OF "WHERE IS IT?"

ON page 2168 are some descriptions of places to be guessed. These are the places: 1. Benares, India. 2. Petrograd. 3. Upper Burma. 4. Cape Town. 5. Plymouth Hoe, England. 6. Canadian Pacific Railway in Manitoba. 7. Tahiti, Society Islands, Pacific Ocean.

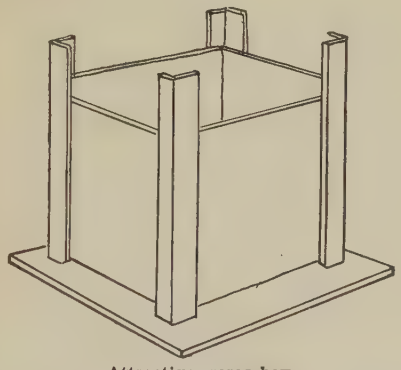
MORE BOX FURNITURE TO MAKE

WE have already talked together about our tools and equipment, and we have studied the main features of box furniture. We know how to make the legs, or corner trim, as we sometimes say, and are now ready for business. In our carpentry work we shall make lots of different pieces of furniture: a footstool, which is easy enough to make when you know how; a general-utility box which can be transformed into a window-seat; a blacking box which every boy will surely be proud to have as his very own; a dainty little rack for a vase or for books, which will look very attractive in the study room; and some other things too.

Just think of the fun in transforming a plain, ordinary packing box into a flower-stand or a table book-stand! Come along, big boys, little boys, and your sisters, too, for you all may join the class.

SCRAP-BOX

THIS attractive design has many uses, and it is very easy to construct. The charm of it lies in its very simplicity. For father's den, brother's study, or for mother's sewing-room an artistic scrap-basket is always acceptable. Just try and see how very easy it is to make.



Attractive scrap-box.

The grocer will probably be able to give you a box about the size of a stuffed-olive box, which is about 10 inches deep and 8 inches square. A box that is only 6 inches deep and 7 inches square will be quite as satisfactory. For the legs, or corner trim, you need four strips $\frac{3}{8}$ inch thick, 1 inch wide, and 3 inches longer than the height of the box; and four strips $\frac{3}{8}$ inch thick, $1\frac{3}{8}$ inches wide, and 3 inches longer than the height of the box. For the false bottom we need one piece of board that measures $\frac{1}{2}$ inch thick and is 4 inches larger than the box each way.

First remove the cover or the top end of the box. Then make the corner trim 3 inches longer than the height of the box. Turn the box upside down and place the false bottom, or base, upon it, allowing the bottom to project 2 inches all around; and secure it by nailing through it and into the edges of the four sides. Eight nails or screws are sufficient to hold it firmly. If the sides are too thin to receive the nails, put them through the real bottom, and clinch the nails on the inside. It is best to nail without clinching if you can do so. Invert the box, placing it upon its new base.

Now we are ready to make the legs. Place one narrow strip with a wider one, and nail the face of the wide strip to the edge of the narrow one, forming a right angle, and making each side of the angle measure alike. To join them together, use small nails or large brads a short distance apart. A little glue used before you nail the pieces together would hold it firmer. Make all four legs in the same way, by putting together a narrow and a wider strip. Nail a leg to each corner, and clinch the nails on the inside if they project. A neater exterior will result if you use short screws, about $\frac{5}{8}$ inch long, and run them from the inside, using four on each corner.

With the false bottom joined to the box and the four legs added, the scrap-box is complete and ready for the finishing touches. With a piece of sandpaper rub it carefully, making the sides smooth; and fill with putty all the nail holes and imperfections, making the surface even. You may stain it any color you desire, but a dark mission effect is very pleasing.

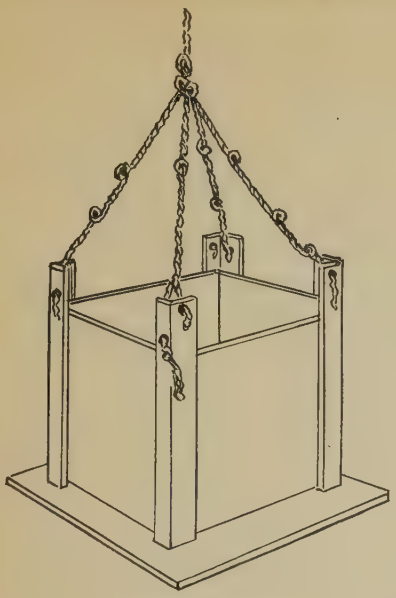
HANGING FLOWER-BOX

THE scrap-box which has already been described, may be converted with a slight change into a hanging flower-box. The materials needed are the same as for the scrap-box with the addition of several feet of ordinary clothesline.

Make the scrap-box just as described before. Then bore three holes, each $\frac{1}{2}$ inch, in the end of the leg which projects beyond the top of the box: one hole in one face and two holes in the other face of each leg, all located at different levels, as shown by the knots in the illustration. Or you may make just one hole in each leg one inch from the end of the leg, right in the angle where the strips are joined. If you make just the four holes, then, from the rope, cut off two lengths of 3 feet each. Run one end of the rope through the hole, tie a strong knot on each side of the hole to hide it. Tie a number of knots, and then run the other end through the hole in the next leg. The other piece of rope is attached to the other two legs, and knotted in the middle with the first rope. Make the knots at uneven intervals, using two in some and three in others, to obtain the desired artistic effect. The charm of these hanging boxes depends largely upon the clever and simple method of hanging.

This little box for holding a flower-pot is designed to be used in pairs, suspended in the window from two pulleys in such a way that they will pass each other when the plant is drawn down to be watered. If you cannot find a pulley to use, ordinary screw-eyes will serve the purpose.

If you suddenly need a little stool to hang pictures, you may instantly convert the flower-



The hanging flower-box.

box into an ornamental little stool simply by taking out the outside knots, removing the ropes and turning the box over to stand on its legs.

PERFORATED SCRAP-BOX OR HANGING LANTERN

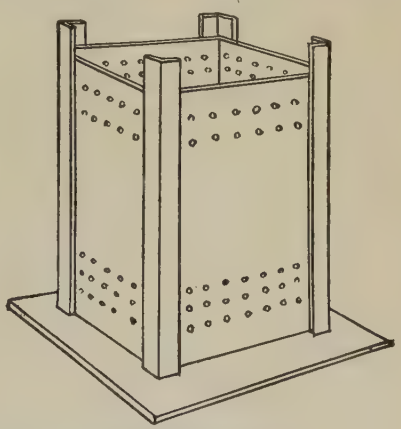
THIS convenient little article has three distinct uses. As a waste-paper box or basket, it is very ornamental and unique. As a stool, it simply needs to be turned the other side up. As a hanging lamp shade, to be used in the hallway where only a soft, dim light is desired, it is also very unusual and useful.

A good size for a scrap-box would be about 15 inches deep and 10 inches square, though an olive-oil box or a stuffed-olive box with slightly different dimensions would answer very well indeed.

Besides the olive-oil box you need the following materials for the legs and top: four strips $\frac{3}{8}$ inch thick, $1\frac{1}{8}$ inches wide, and 4 inches longer than the height of the box; and four more strips of the same thickness and length but $1\frac{1}{2}$ inches wide; and for the top, one piece $\frac{1}{2}$ inch thick, and 2 inches larger each way than the end of the box. If you are going to use it as a hanging lantern, you will need the strips for the crown frame, four pieces $\frac{1}{2}$ inch thick, 2 inches wide, and 8 inches longer than the outside width of the box. A dozen feet of ordinary clothesline completes the requirements.

Remove the cover of the box and plane the edges so they will be smooth and even. Remove one side. Place the box on its end and put the top in position so that it will project the same distance over the sides, and then carefully nail it on the box, using only enough nails to hold it firmly, and not too many to mar the effect. Turn the box over again and put on the legs, which are made in the usual way. Measure the distance between the legs, and saw the cover just the size to fit snugly in place. Hang the door, using the hinges on one side. Now, you will need to have a ruler, a sharp pencil and a sharp eye. Mark the places for six rows of holes near the top of the lantern and four rows near the bottom, allowing 1 inch between the centres of the holes. Bore the holes $\frac{1}{2}$ inch in diameter where you have placed the pencil marks, on all four sides. With your ruler trace a light line on the top between opposite corners. On this line, about $\frac{3}{4}$ inch from the corner mark a point, which should be about halfway between the outside corner of the leg and the corner of the top. Bore a hole $\frac{1}{2}$ inch in diameter through the projecting corner, and repeat for the other three corners.

Lay one of the lower pieces of the crown frame on top, keeping it in line with the holes and allowing the frame pieces to project equally over the top. Mark the place for the holes and bore them $\frac{1}{2}$ inch in diameter, and use this as a pattern to bore the other three pieces. Your scrap-box is now complete. If you wish to use it as a hanging lantern, take four equal lengths of the rope, run one piece through each corner, and knot the ropes. Suspend the frame 3 inches above the top of the lantern, and tie knots in the ropes to hold it in place. Place a few knots at unequal distances, and tie the ropes all



The hanging lantern.

together at the other end. Your artistic hanging lantern is now ready.

If you are going to stain or varnish it, do so before putting on the ropes. It may be stained a soft shade of green or brown to harmonize with the surroundings.

FOOTSTOOL

A FOOTSTOOL is a convenient piece of furniture in any house, and the boy carpenter can easily make one for his mother or for himself.

A dry-goods shop or a grocery store can supply you with a box suitable for this stool. You want one that is about 12 inches square and 5

inches deep, or an oblong box that is 14 inches long, 8 inches wide and 5 inches deep. In selecting your box choose one that is free from knot-holes, brands or other blemishes, for you want the finished article to look well. For the top you will need a piece of wood about ¾ inch thick, and 2 inches greater than the box in length and width. If the box is 12 inches square, then this piece must be 14 inches square. For the legs you need four pieces, ⅜ inch thick, 1⅜ inches wide and 7 inches long; and four other pieces, ⅜ inches thick, 1¾ inches wide and 7 inches long.

Make the legs in the usual way by joining the two pieces, and then round off one end of each leg.

Take the cover off the box, and turn the box upside down and nail a leg on each corner, carefully clinching the nails on the inside. Turn the box right side up again, setting it on the legs, and then place the false top in it, allowing an even projection on each side. Nail this top on securely, using about two nails over each leg.

The footstool may be improved for use in the kitchen, where the cook likes to have a useful stool with a place for the hand on the top, so that she may carry it in one hand when the other hand is full. To make the opening for the hand, mark with your pencil the middle of the top piece; then bore two holes and saw out the wood between them, making a hole about 1 inch wide and 2½ inches long. Smooth the edges with sandpaper.

If you wish to use your footstool as a fern-box it may be made in such a way that it will serve two purposes. We know a little boy who made this article from a Baker's Chocolate box which measured 9½ inches wide, 10¾ inches long and 4¾ inches deep. The legs were made 4 inches longer than the box. The top, which was made from a piece of board which the carpenter cut for him, was 11¼ inches wide and 12½ inches long.

He preferred to use screws, and so bored four small holes through the inside of the box into each leg, and then with the screwdriver finished securing the screws. His screws were short enough not to show on the outside of the legs, and yet long enough to hold the legs firmly to the box. For use as a fern-box he inverted the footstool and placed a large drooping fern inside. The effect was very pretty.

THE LITTLE BIRD THAT TURNS AROUND

A SIMPLE toy that any boy or girl can make with a piece of stiff paper or card, a pair of scissors, and pen and ink, will give much amusement and cause considerable surprise to those who do not know the secret of how it works.

When the completed toy is made we show it to our friends, as in the second picture, and they see a bird-cage with a bird looking to the left. Suddenly there is a click and the bird has turned around and is looking to the right. Again there is a click and the bird has turned back and looks to the left.

The little toy is made in this way. We take a piece of cardboard 4 inches square and turn back a strip at the top and bottom. Then we draw in the front, filling up all the space, a bird-cage, and cut the spaces in between the bars with a sharp penknife.

The width of the bars and of the spaces should be the same right through, and a good width is ⅛ inch. The appearance of this cage is as shown in the first picture. Now we cut out of a postcard a piece of card just the right width to slide backward and forward in between the two folded flaps of the cage, and a little longer than the cage.

We slip this card in between the turned-back flaps of the cage, and then draw on the parts of the card that show in between the bars the parts of a bird that would be seen through the bars. It should be looking to the left, and we can draw first with pencil, and then ink in. The appearance will be as in the second picture.

Now, pulling the card gently by the end until the bird has disappeared entirely, the parts we have already drawn being now hidden by the bars, we draw a similar bird on the card, only looking the other way. Now, by pulling the card first a little to the right and then a little to the left, we change the position of the bird, because we bring the two pictures alternately into view through the openings of the bars. With a little practice we soon get skillful in manœuvring the card and cage, so that we change the bird's position in a moment without our friends seeing how it is done.

The parts of the bird and cage.

Of course, there are endless variations of this toy. We can, while using the same cage, make many other inmates by drawing them upon different cards. A lion can be made to change suddenly into a tiger, and so on.

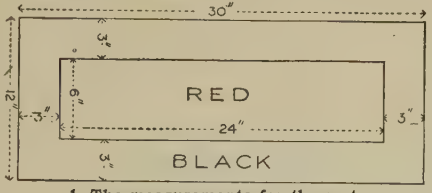
If we prefer it, we can dispense with the cage and make the bars merely a shutter in which to pull a picture card backward and forward.

The most important part to remember is that the bars and openings must be identical in width, and must be cut out very neatly.

HOW TO MAKE A LITTLE WOOL MAT

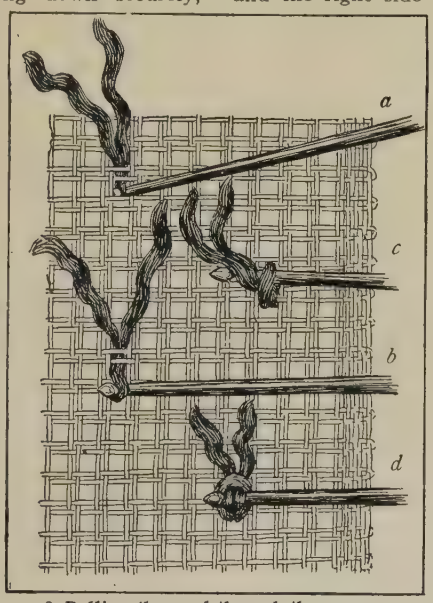
A CANVAS rug mat, which is quite easy to make, can be used to go under the piano or the writing-table. Or, if we like to make a tiny one, it will do for a doll's baby carriage or a toy motor car.

Let us make, for a first attempt, quite a small mat, say, one measuring 30 inches in length and 12 inches in width. One advantage in letting the mat be 12 inches wide is that a canvas that width can be bought at so much a yard. All we have to do is to cut off 31 inches from the yard length; the extra inch is to allow for folding over ½ inch for tacking at each end. These folds need stitching down securely, because the canvas is stiff and springy, and the rough edge ravels easily.



1. The measurements for the mat.

The next point to decide is the kind and quantity of wool. Girls and boys who are good at reckoning will find the canvas for our mat has 2½ square feet in it. We shall want about ¾ pound, or 12 ounces of twisted cable rug wool at about 50 cents a pound for each square foot of canvas. Sums in carpeting and papering are sometimes dry, uninteresting things to do, but we are going to find a carpet sum useful in planning our own mat. Have you found how much wool we shall want? Nearly 2 pounds, is it not? Then we shall buy 2 pounds, for the small quantity left over will be certain to come in useful when making another mat.



2. Pulling the wool through the canvas.

But we do not want all the wool to be of the same color. Our rug must have a border round it of another shade. Suppose we buy ¾ pound of red wool for the centre, and the remaining 1¼ pounds of black wool for the border.

We shall need a wood gauge, costing a few cents, or a strip of cardboard for measuring off lengths of wool, because it is necessary to have all the little pieces of wool for the mat exactly the same length. We also want a rather large wooden crochet hook. To line the mat when finished we shall need half a yard of some dark material such as black linen. A suitable kind is sold at most dry-goods stores usually measuring 40 inches in width.

Having collected the materials, we set about planning our mat. Look at picture 1. With a pencil or piece of chalk we mark the border on the canvas at the same distance from the edge—3 inches all the way round—so that the central part measures 24 inches by 6.

Next, we take the black wool and wind it round the gauge or piece of cardboard—about 4 inches long—winding evenly, but not straining the wool. Then we cut along the groove in the gauge, or along the end of the cardboard.

With the canvas before us on our knees, and the right side uppermost, we take up a piece of the black wool, untwist the two strands, and, doubling one of them in half, push the loop with the fingers of the left hand through the hole in the right top corner of the canvas. With the crochet hook in the right hand we pull the loop down through the hole and up through the next hole to the right. Still keeping the hook in the loop of wool, we next draw the two ends of the wool through the loop so that they stand up from the canvas erect. This is quite easy to do, though it takes many words to tell how it is done—*a* and *b* in picture 2 show the hook through the hole; *c*, the ends being caught by the hook; and *d*, the ends on the point of being pulled through the loop. We tighten and adjust the ends with the fingers; then we take up the other strand of the split wool and fasten it in through the next hole.

We proceed with the same wool along the edge of the canvas until we have filled the rows of holes 3 inches deep. Now, continuing with the black wool at the beginning and end of the row only, we fill the middle part of it with the red wool. We go on filling up the rows like this until we reach the beginning of the 3-inch border along the second side, and from that row continue with the black wool only.

3. The little wool mat finished.

If at any point we find the wool getting too thick and close together, the best thing to do is to leave a hole empty of wool. We have chosen black for the border and red for

the centre, but twisted rug wool is made in many colors, and there is a large choice of reds, yellows, blues, browns and greens. We should of course, think of the color of the carpet when choosing the colors for the mat, and let them match or blend with that.

Having filled the canvas, we now look it over carefully, give the rug a good shake, see that the strands of wool are all the same length, and cut even with the rest any that stand out.

Now we must see about lining the mat with the black linen. This is first cut to the shape of the mat, the edges are turned in, and it is laid, glazed side out, on the back of the mat. It is then sewn neatly and evenly with strong thread round the edge of the canvas. We must be careful to press the wool quite away with the left hand while we are sewing, or we may possibly catch it in the thread.

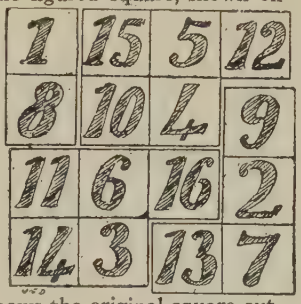
For the little mat which we have been making we have been splitting the twisted cable rug wool into two strands. If we wanted a heavy mat with very thick pile, we could leave it untwisted. In this case we use the same quantity of wool, but work into every other hole of the canvas. Jaffa rug wool at about 40 cents a pound is also used for rug work. It is composed of six fine strands instead of two thick ones as was the case with the wool used in making our mat.

If we want ideas for patterns and colors we can get a lot of help by looking at the rug displays in shops where they are sold. There we can see how colors are combined.

All kinds of pretty patterns are possible in canvas work, and even a patchwork mat of odds and ends left over from previous mats may look very well. But it is unwise to attempt very complicated patterns at first. When we have once made a mat to our satisfaction it will be easy to make another much bigger, which might be used for a carriage-rug, a hearth-rug, or perhaps for a footstool cover. We can find many uses for our rugs.

HOW THE MAGIC SQUARE WAS MADE

A STUDY of the illustrations given here shows how the figured square, shown on page 2166, was cut up and put together again in a different way, so that it became a magic square—that is to say, a square, each column, horizontal row and diagonal of which, when added up, gives the same result.

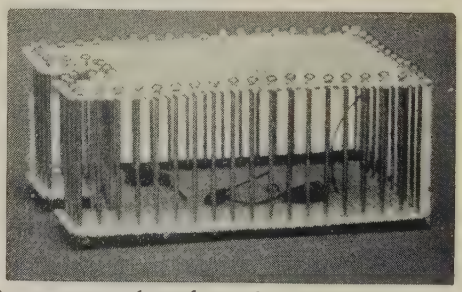


The first picture shows the original square cut. It is next cut into four pieces, one piece containing two figured spaces, another piece four figured spaces, and the remaining two pieces each containing five figured spaces. The second picture shows these four pieces arranged in a new and magic order. It will be found that every column in this arrangement makes 34 when added up, and that every horizontal row and each of the two diagonals give the same result, thus forming a magic square.

A CAGE MADE OF CARDBOARD AND PINS

THE little cage of mice shown in the picture is made of cardboard and pins, and costs a good deal less than a dime.

First we buy a large sheet of perforated cardboard. A store which supplies kindergarten goods will sell us this. Then we cut out of this sheet two pieces each measuring 2¼ inches long and 2 inches wide.



We want some large brown apple-seeds, which we can save from the next apple we eat. Plump dark seeds are best for our purpose, and they should be soaked in water so that the seed coat will be soft.

We choose a rather fine needle, thread it with black cotton and pass it through a seed, beginning at the narrow end, and leaving a piece sticking out to form the tail. We then pass the needle down through a hole in one of the pieces of cardboard, stitch down the tail where it joins the body, and secure the cotton on the under-side of the card. Two or three more mice are dotted about the card in the same way.

Next we get some bright new pins to fit the holes in the card without slipping out, and these we run through the holes along the edge of the second piece of card. A notch at the end imitates the door in the cage, as seen in the picture; and the pins follow round the edge of the notched part. We press the pin down so that its head lies close to the card. Then we put the point of the pin into the corresponding hole in the card with the mice in, and this forms the floor of the cage.

THE NEXT THINGS TO MAKE AND TO DO ARE ON PAGE 2377.

MORE WORTHWHILE GAMES

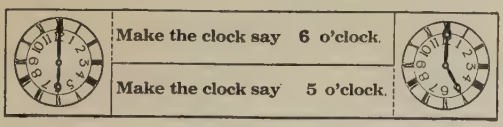
CONTINUED FROM 2055

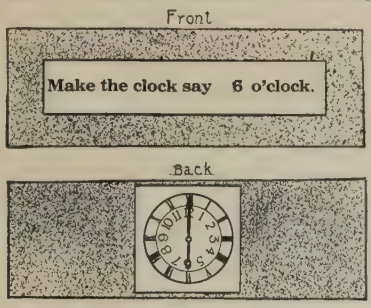
TELLING TIME—NUMBER COMBINATIONS 6–7–8–9
THE BEGINNING OF SUBTRACTION

DO you know what time the first clock says? Seven o'clock is right. And the next? Two o'clock is right. By this time you probably know what all the digits say, so if your clock has digits on it you can tell what o'clock it is whenever the long hand gets to the top. It is then three o'clock if the little hand is at 3, or nine o'clock if the little hand is at 9.

But if your clock has I II III IV V VI VII VIII IX X XI XII instead of 1 2 3 4 5 6 7 8 9 10 11 12 you may be puzzled. They are Roman numerals and they are just another way of saying the same numbers our digits say.

Some clocks and watches use Roman numerals and some use digits.





YOU can make up game cards to learn how to tell time. The first set will be easy, about the hours, 6 o'clock, 5 o'clock and so on. On pages 77 to 82 of your Work Book are the words

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and the pictures that say the same time of day. Put the picture on one side and the sentence on the other side of the cards.

Use an old clock that doesn't run any more, or make a clock face and hands. The reading side tells you what to do, as "Make the clock say 6 o'clock" and the picture side shows how the clock face looks when it says 6 o'clock. So you can teach yourself to tell time.

These clocks say half past seven and half past two. How do you know? Because the long hand is at the bottom. Whenever the long hand is at the bottom the time is half past something. The little hand tells you the rest. It is half past seven when the little hand is at 7, or half past two when the little hand is at 2.

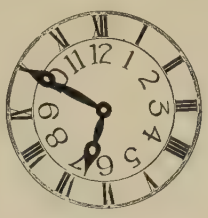
AND these clocks say quarter past seven and quarter past two. The next ones say quarter of seven and quarter of two. When

it will be seven o'clock in a quarter or an hour we say quarter of seven. It means a quarter of an hour before seven o'clock.

Now you can make the second set of time-telling cards. This set tells about the half hours and the quarter hours. It is harder than the first set, so color it differently so you can tell the two sets apart.

Color the corners or make colored borders on this set. Of course you will be careful to make every card in this set the same way.

THESE cards say ten minutes past seven and ten minutes of seven. The next say twenty minutes past seven and five minutes of



seven. Count the little minute marks on the clock and you will see that this is true.

If you like to count fast, count by fives like this: 5 10 15 20 25 30. That gets you to the half-past place quickly.

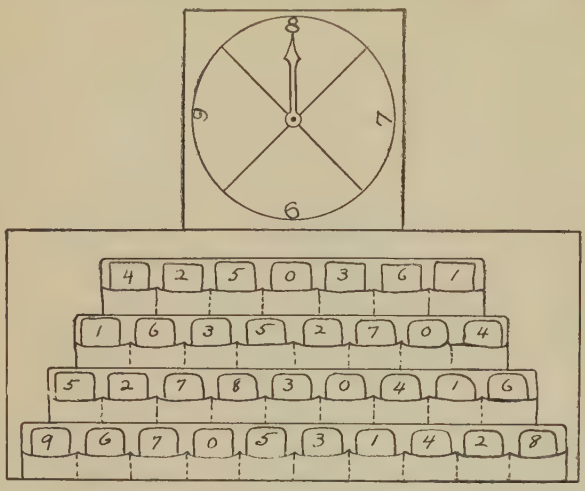
So now you can make the last set, which is the hardest of all the time-telling games. You can play it Just Right very soon after you can play set two. Color this set differently from the others, and when you can play it Just Right no one can puzzle you on telling time.

HOW many different games can you play with these three sets of time-telling cards? You can each in turn take a card, read it, do what it says, turn over the card and see if you are right, and score if you are. If you are not right, of course you will find out how to do what it says, so you can score the next time you get that card.

Or you can read the card and ask someone to do what it says. Then look on the other side. You may score 1 if you read right, and he may score 2 if he did what you read to him. If you made a mistake in reading, it isn't his fault he can't score but it is yours, so you had better let him have a score of 1 anyway.

There are many other games you can make up to play with these sets of time-telling cards.

DOES this look something like your round pocket game? You can play it the same way, but you will learn something different.



These cards tell all the ways to make 6 7 8 and 9. I think you can read from the picture just how to make this set. The combinations are on pages 83 and 84 of your Work Book. Be sure to write the digit on the back of each combination card as you make it.

There are ten ways to make 9, so you will have ten pockets. You better make each pocket about two inches wide. Your game card will have to be twenty inches wide at the bottom.

You remember the games you played with the round pocket game. Start out with those same rules for this game. You remember, too, that you used the combination cards to play with, on your hopscotch board. You can do the same with these harder combination cards. Then make up new rules.

HOW do you know whether you are playing the games better to-day than you played them before? You do want to know, I am sure. Just suppose you scored 5 to-day in a reading game, and you look in your score book for the last score you made in that same game and find your last score was 3. Are you doing better or worse? Yes, better.

Let's look at another game—maybe a numbering game. Your score to-day is 5, but your last score was 6. Are you doing better or worse? Not quite so good a score, is it? You better try a little harder or practice a little more. In another game, perhaps a sound game, your score is 5 to-day and the last score was 5, too. Just the same. If you practice a little you can make it better to-morrow.

When you know in which games you are doing better and in which

you are doing worse, you can tell which to practice on. Here is a game the children call Better or Worse?

From Work Book

Score
Today 5
Before 2
Better or worse?

Better today

One Side

Score
Today 5
Before 2
Better or worse?

Other Side

Better today

On pages 83 to 86 of your Work Book are some records of scores. Mount each one on a card with its answer on the back. Then make yourself a big card. On one side put Better To-day and on the other side put Worse To-day. Now you are ready to play.

Put your cards in a pile. Draw out one. Read the scores and tell if to-day's score is better or worse. If you answer Better To-day, point to the side of the big card that says that. Then turn over your card and see if you are right. If you are not sure which words say Better To-day, ask mother and then put a bright-colored border around them to remind you that they say Better To-day.

WHEN you can play this game, you will know in which games you almost always score better than the other children and in which ones they almost always score better than you. Suppose John usually scores better than you in numbering games but you usually score better than he does in reading and word games. How can you help each other? You know how you learned about the words and you can show him how to practice just as you did. He knows how he learned about the numbers, so he will be a good one to help you. Then you can practice up by yourself with the number games, in the way John shows you, until your score is better. It will be fine if each of you can help the other to score just as well and just as often as you do yourself. I know you will find that it is really more fun to play your games together when each of you scores just about as well as the other.

YOU are glad when your score is better. Do you know how much better it is? This game is called How Much Better?

The Work Book

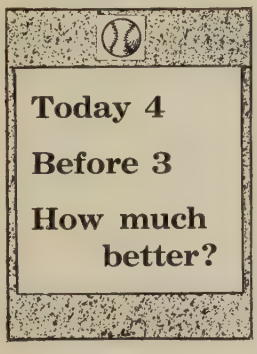
Today 4

Before 3

How much better?

1 better

One Side



Other Side

There are four cards to a book, as in several of your other games. At the top of each four cards draw a picture of some game you like very much. Perhaps you will put a ball on the four cards of one book, and a hurdle on those of another book and so on. Then mount the scores from pages 87 and 88 of your Work Book as the picture shows. The four sets of scores in the same row belong to one book, so mount one of them on each of the four cards that belong together in a book.

You know how to play several games in which you make books, and you know how to score them. Play with these cards any of the ways you enjoy the most.

When you find out how much better you play to-day than you played before, you are subtracting. To-day you score 4 and last time you scored 3. You subtract the 3 from the 4. You say your score is one better. You take 3 away from 4 and have 1 left.

If you score 5 to-day and you scored 3 before, how much better is your score to-day? Yes, 2. When you take 3 from 5 you have 2 left. So your score is 2 better.

If your scores are like this To-day 2
Before 0 you are 2 better than before. When you take nothing away from 2 it leaves 2. You are subtracting.

WHAT HAVE YOU LEARNED?

WHEN you have forgotten a word in your story, can you use your dictionary to find out what it is?

How many words have you in your dictionary? How many of them do you know?

When you are writing a little story, can you find the word you need in your dictionary? Can you write any of them without looking at the card as you write? Without even tracing before you write? How many of them can you write as well as that?

Can you tell when words begin with the same sound? Can you tell without seeing the words, just by thinking the sound as you look at the pictures?

After you have played games with your cards or used them to help you read or write, can you put them back into their right places in the dictionary?

Can you and mother make up new reading games? * Can you score in them? Can you score Just Right in any of them?

How well can you tell time?

Can you tell the hours?

Can you tell the half hours and the quarter hours?

Can you tell the minutes before and after the hours?

Can you tell time on clocks that have the Roman numerals?

Can you count by fives to 30?

Do you know all the combinations that make 6 7 8 9? Do you know them fast as well as right?

Do you know when your score in any game is better than your last score? Do you know which of the children can help you in your learning; and which of them you can help in their learning?

Do you know how much better to-day's score is than your last score?

Can you subtract numbers like this

5	4	3	5	2	?
2	2	1	1	0	
–	–	–	–	–	

*Note to parents: You can pattern new games, as the vocabulary of the child increases, on the plan of the old.

THE NEXT HELPS TO LEARNING ARE ON PAGE 2383.

SOME OF THE BEST KINDS OF NUTS

Almonds.

Walnuts.

Beechnuts.

Spanish Chestnuts.

Filberts.

Hazelnuts.

Nuts are among the most nourishing and healthful of foods, and contain much oil. In America various kinds grow wild, but there are several other kinds of nuts which are also cultivated with great success.

The coconut and its blossom.

How the Brazil nuts grow.

THE NATURAL HISTORY OF A NUT

CONTINUED FROM 2162

WHAT is a nut? It is among the most valuable of all the fruits we eat. When the fruit of a tree or a shrub is inclosed in a bony, woody or leathery covering that does not open when ripe, it is commonly called a nut. Some people, indeed, live almost entirely on nuts.

Nuts differ very much in their formation, and fruits like the walnut and chestnut, which have a thick outer covering that has to be removed before what we call the nutshell is exposed, are really at a stage between a stone fruit, like the plum, and a nut that has its shell exposed, like the hazel.

Of the commercial nuts one of the most curious is the almond. The almond tree is really a near relative of the peach and nectarine, but the fruit, instead of having an outer covering of delicious pulp which develops and sweetens, has a covering that shrivels as the fruit ripens; and when the ripening process is complete, it has become a horny kind of husk that splits open and frees the pit. Two kinds of almond are grown, the sweet and the bitter. The sweet one is used for dessert on account of its rich and pleasant flavor, and the bitter one provides a flavoring extract. When the oil has been distilled from the bitter almond it contains prussic acid, from which it has to be freed before it can be used for cooking purposes.

The almond tree is very beautiful, one of the first to blossom in spring, and there is no more cheerful prophet of coming summer than this tree, bare of leaves, but clothed in a glorious mantle of pink blossom. In certain climates it does not have fruit; and where it does, there is a good deal of difference in the texture of the shells. The writer has in his garden an almond tree that bears nuts the shells of which are so hard that they need a hammer to break them. On the other hand, by careful selection of those seeds with comparatively thin shells and by constantly breeding from them, men have produced a variety of almond tree which yields nuts with shells so thin that they can be broken with the fingers. This variety of plant is known as the paper-shelled almond.

Most of the almonds we eat come from France, Spain, Italy and northern Africa, but California now grows large quantities for consumption in America. When the nuts are ripe and the husks have split open, the branches of the trees are shaken or beaten, and the fruit drops on to canvas sheets laid on the ground. The nuts are freed of their hulls by machinery and then dried and bleached by sulphur fumes. It is

therefore quite a mistake to suppose that the almonds with bright yellow shells are necessarily of the best quality.

Another great favorite is the so-called English walnut, though it was introduced by the Romans. It is a native of Greece and of southern Asia. The tree is very handsome, with graceful branches, and the warm hue of the leaves in spring adds a pleasing touch of contrast to the foliage of other trees. The flowers begin to open in April, and are in full bloom by the middle of May. The wood of the trees is very valuable, the beautiful grain making it popular with cabinet-makers. It is the best timber for gun-stocks, and so important was it regarded from this point of view that, in several European countries in the seventeenth century, before a man could marry, he had to produce a certificate showing that he had planted a certain number of walnut trees. This may have seemed a hard law at the time, but the plantations eventually enriched many of the planters. The tree grows rapidly, and the age at which it is usually cut for its timber is fifty or sixty years.

THE WAY THE FRUIT FORMS IN THE WALNUT'S SHELL

When the fruit first forms, the shell inside is soft and the fruit, in its green outer case, is gathered for picking. Later the shell inside hardens and the corrugated kernel becomes sweet and crisp. About half the weight of the kernel is oil, and the walnut-oil pressed out from the kernel is used for a variety of purposes. The tree can be raised from seed or it can be propagated by budding or layers. The walnut flourishes in any fertile soil so long as the subsoil is dry and the position a little sheltered. In England a line of walnut trees is often used as a screen for orchard trees in an exposed position. The common walnut ripens well in the south of England, but bigger and finer nuts are produced in southern Europe and in California.

Several other species of walnut are grown in America. One of these, the butternut, is cultivated for its oil. The nut is long and pointed, and from its clammy green husk good housewives in olden times obtained the stain with which they used to dye their homespun woolen garments. A palatable sauce is made from the nuts when they are green, and the ripe nuts are much liked.

The black walnut is a native of America, but has been introduced into Europe. It has an outer cover much rougher and rounder than that of the common walnut. The kernel is sweet, but the shell is exceedingly hard. Boys break them with a hammer, and squirrels have to gnaw vigorously to get through them. Farmers, when they plant the nuts, always crack the shells so that the young plant can get out when it germinates. The wood, like that of the European walnut, is much valued for gunstocks, and for cabinet-work of various kinds.

THE DELICIOUS HICKORY NUT OF AMERICA

The favorite nut in America is the hickory. There are several species, all natives of North America. Generally they grow wild, but experts are now beginning to give their attention to the hickory, and trees are being improved by cultivation and selection. The Indian formerly used the nuts as a leading article of his diet, and collected large quantities to store for the winter, and the early British settlers followed his example. Imitating the Indian squaws, the white settlers used to pound the nuts, shells and kernels together in a mortar, and after boiling them in water, they strained out the hickory-milk, to which they added corn meal, and from the product baked cakes on hot stones or in ovens. Hickory wood is one of the strongest and toughest known. It is used for wheels, tool-handles and other things where strength and elasticity are needed.

THE CHESTNUT TREE THAT MAY GROW TO THE HEIGHT OF 100 FEET

Another American nut allied to the hickory is the pecan, and large plantations of it exist to supply the commercial demand. It grows in southern United States, and when allowed, the trees grow to a great height. The wood, however, is almost worthless for commercial uses. Both hickory and pecan are members of the Walnut Family.

The sweet chestnut of Europe is really a native of Asia Minor and Greece. It grows to a great size, and is a very fine tree, towering to a height of eighty or a hundred feet. Some trees are believed to have lived for more than five hundred years. The leaves are large and lance-shaped with saw-like edges, and the flowers hang in long yellow catkins. The fruit is contained within a strong skin or

GATHERING THE HARVEST OF COCONUTS

In the Philippines the coconuts are knocked down from the trees by men with long poles, who stand with bare feet on poles laid across the branches. The work is very risky, owing to the danger of slipping.

After the coconuts have been knocked down, they are collected and formed into rough circular rafts. Poles are then laid across the tops of the rafts, which are steered downstream to the local markets.

leathery coat, and this is surrounded by a second coat, a kind of overcoat, covered with spines. When the nuts are ripe, the burr opens and allows them to fall.

The tree begins to bear in about twenty-five years, and its timber is at its best from that age to fifty or sixty. The bark is very distinctive, for though, when the tree is young, this is smooth and brown, as time goes on, it becomes gray and the surface splits. The chestnut keeps its leaves till late autumn, when they become a golden yellow, and in France these are often used as stuffing for mattresses or litter for cattle. The North American chestnut is very much like the European, but the nuts are not so large. In recent years a deadly fungus has destroyed thousands of fine chestnut trees. For some time no remedy could be found, but lately some trees have been saved. The chinkapin (or chinquapin) is a dwarf chestnut found in the United States and Mexico. It bears only one nut in a burr.

THE WAYS OF THE HAZEL, THE FILBERT AND THE COB

The common hazel bears an excellent nut. The plant rarely attains the dimensions of a tree, but is generally a shrub, growing in hedgerows and among the undergrowth of woods and coppices. It flourishes even at a height of fifteen hundred feet above sea-level.

The hazel, a relative of the oak, beech, birch, alder and chestnut, is a straggling bush, with long stems rising directly from the root, and the leaves are rounded and pointed, with a saw-like edge. The male flowers, which hang in yellow catkins, appear before the leaves, and are, indeed, among the earliest harbingers of spring. The female flowers, which are less conspicuous and are like swollen buds, can be seen on the upper parts of the shoots and branches and may be detected by means of the crimson threads that issue from them.

The leaves remain on the hazel until almost every other tree is bare. The bright yellow color in autumn gives a lovely touch of color to the countryside. The tree is not bare even after it has lost its leaves, for the catkins then expand and remain all the winter.

THE FAMILIAR BEECHNUT THAT HAS NO COMMERCIAL VALUE

The filbert and the cob are simply cultivated varieties of the hazel. The filbert has a very full husk which completely conceals the nut, and the cob is much larger than an ordinary hazelnut. The Barcelona nuts we buy in the fruiterer's shop are the nuts of the Spanish hazel.

The beech, although a fine tree, is scarcely worthy to be classed among our nut trees, for its fruit is small, consisting of two triangular-pointed nuts in a seed-vessel which opens in four valves and is covered with blunt prickles. Beechnuts are of little commercial value, but are prized by many, especially children.

Cashew nuts are kidney-shaped in a hard shell, and are borne on flesh-colored stalks that look something like fruits. They grow in the West Indies and tropical America on a tree very much like the walnut, and the nuts are eaten roasted in oil or salted like almonds.

Pistachio nuts, well known to cooks, are the seeds of a tree of the Cashew Family (related to our sumac) and which grows in western Asia and southern Europe. The nuts are about the size and shape of a filbert, and have a pale green kernel with a yellow or reddish skin, and they are eaten in large quantities in India. In Europe and America they are used only for flavoring.

ONE OF THE MOST EXTRAORDINARY NUTS IN THE WORLD AND HOW IT GROWS

One of the most extraordinary nuts in the world is the Brazil nut of South America, which grows on a tree from 100 to 120 feet high. The nuts as we buy them are shaped like the sections of an orange. They are in reality seeds and not true fruits like chestnuts, walnuts and the other nuts we have mentioned. They are contained in a large woody seed-vessel nearly as big as a man's head, and so heavy that, if one fell from seventy or eighty feet upon the head of a person walking or standing beneath, it would probably kill him. The natives of the Brazilian forest, when walking in the neighborhood of the trees at the time the nuts ripen, cover their shoulders and heads with a strong buckler of wood.

Inside the massive wooden seed-vessel are four divisions, and in each of those divisions lie a number of the triangular nuts that we know. The whole fruit is a truly marvelous production, and the massive seed-vessel grows in fifty or sixty days. The outer wooden case is at least half an inch thick and is difficult to open

AT WORK IN THE HEART OF COCONUT LAND

The coconut-palm loves sea-air and is found growing on or near the shore. This avenue of palms from which ripe nuts are falling is in Hawaii.

The coconut, one of the most valuable plants, is used for a variety of purposes. Here we see natives of the Philippines removing husks from the nuts.

California is the great land of fruits, and most varieties of European nuts have been introduced and flourish there. In this picture we see the harvesting of walnuts in a great plantation near Los Angeles.

even with the sharpest instrument. The nuts contain as much as 56 per cent oil, and this is pressed out by the natives and often used for lighting purposes. If we cut a Brazil nut flat at one end and sharpen the other end to a point, like a wick, we can stand the nut on a plate, light the wick and see it burn brightly enough to lighten a room. This will give us an idea of how much oil it contains. The Brazil nut is sometimes called the juiva.

But the most useful of all the nuts that grow is the coconut. Its uses are legion, and it is impossible to suggest even a tenth of them here. Brushes, clothes, mats, nets, rope, paper, quilts, hats, sails and torches are made from the fibre; fuel, oars, huts, yokes and knife-handles are made from the timber; the hard shells are used for drinking-vessels; a drink is made from the so-called milk; the white nut part is eaten as it is and shredded for use in confectionery and cakes; and from the oil we make oleomargarine, soap, candles and lubricating oil.

These are only a few of the uses of coconut, and there seems no limit to their multiplication. Even ink and gum can be made from this universal provider among the plants. It has been said that a man could live and clothe and house himself on the coconut.

THE INGENIOUS WAY IN WHICH NATURE PROTECTS A WONDERFUL NUT

The coconut-palm loves the sea-air, and flourishes best on the shelly soil of a tropical shore. If we look at the Plant Map of the World in Volume 19 we shall see that the coconut-palm follows the seashore very closely. It commonly grows leaning toward the water, and with its crown of leaves and clustered nuts it is a very picturesque tree. But it is the fruit which is so wonderful. It is the most richly stored seed of all known plants and is protected in a most ingenious manner. The nut as we see it in the fruiterer's shop is not the complete fruit. Part of its covering has been removed.

Right inside is the kernel, a single seed, from which a young coconut tree may grow. It has round it the white fleshy meat that we eat, which is really food stored up for the use of the kernel when it begins to grow. There is also a quantity of fluid called milk, which is to supply moisture to the kernel when it is developing in the shell. Next comes the hard shell which we know so well. But Nature decided that even this was not sufficient protection for the coconut. The nut hangs seventy feet or more from the ground, and when it falls it might get cracked, so outside the hard shell is a great mass of fibre which acts like a spring and breaks the fall and saves the shell from damage. Outside all this is another green covering.

There is another wonder about the coconut. If we look at one we shall see at the blunt end three round spots, and if we take a sharp penknife and try to cut into them we find that two are quite hard and difficult to penetrate, while the third is softer. Schoolboys call this soft hole the hole that lets out the milk, but it is in reality the hole that lets out the young coconut tree which sprouts from the kernel inside.

THE THREE HOLES IN THE COCONUT AND WHAT THEY MEAN

But why are there three holes? The coconut belongs to a family of plants whose seeds are arranged in threes, and at one time the ancestors of the coconut undoubtedly produced its seeds in threes. Now, however, it produces only one seed. The other two have disappeared, but there still remain traces of the holes by which the sprouts of the other two germs used to emerge from the shell. These are the two hard eye-spots, for now that there is nothing to come out of them, they have become covered with hard shell.

If we can see a coconut as it comes from the tree with the covering of fibre on it and the outermost case, we shall notice that it is more or less triangular in shape. This is thought by some to be a survival from the time when the nut produced three seeds in three compartments.

THE TREE THAT GOES ON GROWING NUTS FOR EIGHTY YEARS

The coconut tree is widely distributed on tropical shores. It is commonly believed that the nuts often fall into the sea and are carried by the waters to other lands, where they are thrown up and often sprout and grow into trees. Recent studies of scientific men, however, cast much doubt upon the truth of this belief. The tree begins to bear fruit when it is eight years old, and it goes on producing for eighty years.

THE NEXT STORY OF PLANT LIFE IS ON PAGE 2409.